AERONAUTICS AND SPACE BIBLIOGRAPHY

Lewis

FOR
SECONDARY
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COMPILED FOR

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

BY NATIONAL AVIATION EDUCATION COUNCIL

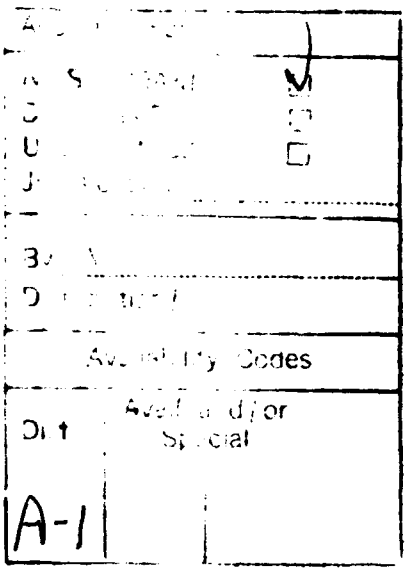
A BIBLIOGRAPHY

of

AEROSPACE BOOKS AND TEACHING AIDS

for

SECONDARY SCHOOL STUDENTS AND TEACHERS



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PREFACE

The appearance of the Space Age—ushered in with dramatic effect by the launching of Sputnik I in October 1957—has resulted in a tremendous public interest in the exploration of space. To nourish this growing interest a considerable number of books have appeared in the last 3½ years to explain to young people and their teachers the facts and implications of man's newest frontier.

Thus, with the exception of a very few titles, all the books listed in this bibliography have been published since December 1957. Approximately 85 percent of these pertain to space flight and related subjects. About one-third of this group deal with the science of astronomy, for it is generally recognized that man's activities in space are inevitably bound up with the laws and environment of the universe. The remaining titles listed are concerned with meteorology and aeronautics. These latter books, with few exceptions, are confined to those of general interest published in 1960 and in the first 6 months of 1961.

Textbooks containing sections and chapters on space flight and aeronautics have not been listed as almost all widely used social studies or science texts include material on these subjects.

In addition to books this bibliography also includes (1) a brief list of bibliographies, dictionaries, and other references; (2) a catalog of some free and inexpensive aerospace teaching aids; and (3) films and filmstrips. The teaching aids, films and filmstrips have been included to aid teachers in their search for supplementary instructional materials. While most of the items are for students, many of them are designed for teachers. Some of the teaching aids listed deal with aeronautics and meteorology and thus reflect the general subject areas covered by the books listed in this bibliography.

In each case, requests for free materials and orders for sale items should be sent directly to the publisher or supplier. Addresses of publishers may be found on page 40.

The books and teaching aids appearing in this bibliography comprise a partial listing, and the bibliography should not be considered as complete or exhaustive. The listing of any of the items included does not constitute an endorsement by the National Aeronautics and Space Administration nor by the National Aviation Education Council.

The National Aviation Education Council wishes to acknowledge with thanks the generous assistance and advice received from the American Association for the Advancement of Science and the Education Committee of the American Rocket Society; also, the help of the many representatives of publishers, organizations, government agencies, and firms whose cooperation was solicited and courteously extended.

PART I—BOOKS

Section 1—Space Travel and Space Exploration

Books in this section deal with plans for manned and unmanned space exploration, the dangers of space travel, trips to the moon and the planets, the astronauts, space stations, the X–15 rocket ship, rocket and satellite launchings and research, space science, and the history of rocketry and space flight.

ADLER, IRVING. MAN-MADE MOONS. Day, 128 p., illus., 1958. $3. Rocket propulsion, space, and what we can learn through earth satellites.

ADLER, IRVING. SEEING THE EARTH FROM SPACE. Day, 160 p., illus., revised 1959. $3.50. Detailed reports on our satellites and what they tell us.

ALLEN, W. GORDON. SPACE-CRAFT FROM BEYOND THREE DIMENSIONS. Exposition, 202 p., illus., 1959. $3.50. New theories to explain such phenomena as Unidentified Flying Objects, Flying Saucers, and life on other planets.

BATES, DAVID R., editor. SPACE RESEARCH AND EXPLORATION. Sloane, 287 p., illus., 1958. $4. A collection of essays by 12 British missile and space flight experts, for the general reader.

BELL, JOSEPH N. SEVEN INTO SPACE. Hawthorn, 192 p., illus., 1960. $3.95. The story of *Project Mercury*—its background, growth, and the selection and training of our seven astronauts.

BERGAUST, ERIK. FIRST MEN IN SPACE. Putnam, 47 p., illus., 1960. $2.50. The many tests which our astronauts and their equipment must undergo are clearly described.

BERGAUST, ERIK. ROCKET AIRCRAFT, USA. Putnam, 48 p., illus., 1961. $2.50. The story of the development of rocket powered aircraft with special emphasis on the X–15.

BERGAUST, ERIK. ROCKETS TO THE MOON. Putnam, 48 p., illus., 1961. $2.50. Current and future plans for moon probes and for unmanned and manned expeditions to the moon.

BERGAUST, ERIK. SATELLITES AND SPACE PROBES. Putnam, 48 p., illus., 1959. $2.25. Pictures and information on the satellite and space programs of the world.

BERGAUST, ERIK and SEABROOK HULL. ROCKET TO THE MOON. Van Nostrand, 270 p., illus., 1958. $5.95. How man will reach the moon and what he will probably find there.

BERGMAN, JULES. NINETY SECONDS TO SPACE: THE STORY OF THE X–15. Doubleday, 224 p., illus., 1960. $4.50. An account of the X–15 rocket test plane and its pilots who have guided this aircraft to the fringes of space.

BERKNER, LLOYD and HUGH ODISHAW, editors. SCIENCE IN SPACE. McGraw-Hill, 458 p., 1961. $7. Scientific research and the impact of space exploration.

BRANLEY, FRANKLYN M. EXPLORING BY ASTRONAUT: THE STORY OF PROJECT MERCURY. Crowell, 104 p., illus., 1961. $3.50. The story behind America's plan to put man into space. Includes descriptions of the *Mercury* capsule and instruments, tracking and recovery systems, and the astronauts.

BUCHEIM, ROBERT and the staff of The Rand Corporation. SPACE HANDBOOK: ASTRONAUTICS AND ITS APPLICATION. Random, 303 p., illus., 1959. $3.95. Also available in paper covers from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Cat. No. 86–1:H.doc.86, 60 cents. The first basic description of space flight in all aspects, written for the general reader. Originally prepared for the Select Committee on Astronautics and Space Exploration, House of Representatives.

CAIDIN, MARTIN. THE ASTRONAUTS. Dutton, 132 p., illus., 1960. $3.95. The story of *Project Mercury*, America's man-in-space program, with emphasis on the selection and training of the seven astronauts.

CAIDIN, MARTIN. SPACEPORT U.S.A.: THE STORY OF CAPE CANAVERAL. Dutton, 380 p., illus., 1959. $4.95. The full story of America's rocket and missile testing ground at Cape Canaveral.

CAIDIN, MARTIN. X–15: MAN'S DARING FLIGHT INTO SPACE. Ridge, 64 p., illus., 1961. Paperback, 25 cents. The biography of the experimental rocket airplane—the X–15—and the men who fly it.

CLARKE, ARTHUR C. THE EXPLORATION OF SPACE. Harper, 200 p., illus., revised 1959. $4.50. Available also in paper covers from Fawcett, 50 cents. A book for those interested in general facts regarding the "why" and "how" of astronautics.

CLARKE, ARTHUR C. INTERPLANETARY FLIGHT. Harper, 144 p., illus., revised 1960. $3.50. An updated revision of a "pioneer" book on astronautics that offers much for readers who want to know more than they find in the usual popular books on space flight.

COOMBS, CHARLES. GATEWAY TO SPACE. Morrow, 256 p., illus., 1960. $3.95. Problems of manned space flight are examined in the light of today's accomplishments and future plans.

COX, DONALD. STATIONS IN SPACE. Holt, Rinehart & Winston, 64 p., illus., 1960. $2.95. Explanations of the known facts about space stations as conceived by leading space scientists.

COX, DONALD and MICHAEL STOIKO. ROCKETRY THROUGH THE AGES. Holt, Rinehart & Winston, 41 p., illus., 1959. $2.95. A history of rocketry with a look to the future.

CROSSFIELD, A. SCOTT with CLAY BLAIR, JR. ALWAYS ANOTHER DAWN. World, 421 p., illus., 1960. $4.95. The autobiography of America's foremost test pilot and his experiences with the experimental rocket ship X-15.

DAVIS, CLIVE E. MAN AND SPACE. Dodd Mead, 96 p., illus., 1960. $2.75. America's two major space projects—the X-15 and *Project Mercury*—are emphasized in this summary of present day knowledge of the universe and its relation to earth.

DEL RAY, LESTER. ROCKETS THROUGH SPACE. Holt, Rinehart & Winston, 118 p., illus., 1960. $3.95. Available also in paper covers from Fawcett, 50 cents. An overview of space science.

EGAN, PHILIP. SPACE FOR EVERYONE. Rand McNally, 72 p., illus., 1961. $2.95. An overview of the members of our solar system, stars, and galaxies, with an explanation of rocket and jet propulsion, artificial satellites, and space vehicle launching procedures.

FERMI, LAURA and GILBERTO BERNARDINI. GALILEO AND THE SCIENTIFIC REVOLUTION. Basic, 150 p., illus., 1961. $3.50. A new view of the life and work of Galileo, and his contributions to modern science.

FRAZER, RONALD. ONCE ROUND THE SUN. Macmillan, 160 p., illus., 1958. $3.95. The story of the International Geophysical Year written before it began.

GALLANT, ROY. MAN'S REACH INTO SPACE. Garden City Books, 152 p., illus., 1959. $3.50. Getting man into space and keeping him alive.

GORDON, THEODORE J. and JULIAN SCHEER. FIRST INTO OUTER SPACE. St. Martin's Press, 197 p., illus., 1959. $3.95. A space engineer describes the tense, dramatic events leading to the launching of the first space vehicle ever to penetrate outer space. Readers will learn how it feels to be responsible for a launching.

GUBITZ, MYRON B. ROCKETSHIP X-15. Messner, 288 p., illus., 1960. $4.95. A behind-the-scenes account of the rocketship X-15 and the men who fly it.

HAGGERTY, JAMES J., Jr. FIRST OF THE SPACEMEN: IVEN C. KINCHELOE, JR. Duell, 148 p., illus., 1960. $3.50. A biography of the U.S. Air Force's greatest test pilot.

HAGGERTY, JAMES J., Jr. PROJECT MERCURY. Scholastic, 63 p., illus., 1961. Paperback, 25 cents. The exciting story of the *Project Mercury* astronauts and space vehicle.

HAGGERTY, JAMES J., Jr., and JOHN H. WOODBURN. SPACECRAFT. Scholastic, 128 p., 1961. Paperback, 50 cents. A resume, with explanations, of the spacecraft program of the National Aeronautics and Space Administration—sounding probes, lunar craft, and interplanetary space flight. Suggested student activities are included.

HELVEY, T. C. MOON BASE. Rider, 69 p., illus., 1960. Paperback, $1.95. Describes a testing device for men on long duration lunar missions. It deals with a lunar environment simulator and the psychological factors of the crew selection.

HYDE, MARGARET O. EXPLORING EARTH AND SPACE. Whittlesey House, 157 p., illus., revised 1959. $3. Rocket and satellite research.

JOSEPH, ALEXANDER. ROCKETS INTO SPACE. Science Research, 48 p., illus., 1960. Paperback, 60 cents. The story of rockets and space travel.

KAY, TERENCE. SPACE VOLUNTEERS. Harper, 136 p., illus., 1960. $2.50. A book about the brave men who are engaged in experiments to determine how man will actually fare in outer space. Includes the story of the *Project Mercury* astronauts.

KINNEY, WILLIAM A. MEDICAL SCIENCE AND SPACE TRAVEL. Watts, 150 p., illus., 1959. $3.95. The hazards of manned space flight and how medical science is working to overcome them.

LAPP, RALPH. MAN AND SPACE: THE NEXT DECADE. Harper, 184 p., illus., 1961. $4.95. Probable space developments between 1960 and 1970 based on government plans, the challenge of Sputnik, and the use of earth satellites.

LEAVITT, WILLIAM, AND OTHERS. THE SPACE FRONTIER. National Aviation Education Council, 32 p., illus., revised 1961. Paperback, 50 cents. A description of space, and a summary of man's efforts to explore space. An extensive glossary and a log of U.S. and Soviet satellites and space probes are included.

LENT, HENRY B. MAN ALIVE IN OUTER SPACE. Macmillan, 160 p., illus., 1961. $3. The story of the doctor-scientists who worked to put America's first man into space.

LEY, WILLY. THE CONQUEST OF SPACE. Viking, 160 p., illus., revised 1959. $5.75. What is known and what yet needs to be known for our conquest of space.

LEY, WILLY. MAN IN SPACE. Singer, 48 p., illus., 1959. Paperback, 60 cents. The problems and dangers of man's first step into space. Walt Disney Tomorrowland Adventure Series.

LEY, WILLY. MARS AND BEYOND. Singer, 48 p., illus., 1959. Paperback, 60 cents. How man may someday explore Mars, and what he may find there. Walt Disney Tomorrowland Adventure Series.

LEY, WILLY. SATELLITES, ROCKETS, AND OUTER SPACE. Signet, 128 p., illus., 1958. Paperback, 35 cents. A survey of rocket development and space travel prospects.

LEY, WILLY. ROCKETS, MISSILES, AND SPACE TRAVEL. Viking, 556 p., illus., revised 1961. $6.75. The definitive source book in its field. The newly revised edition includes facts that in earlier editions were only theories, and an extensive annotated bibliography.

LEY, WILLY. TOMORROW THE MOON. Singer, 48 p., illus., 1959. Paperback, 60 cents. A description of today's views on a trip to the moon. Walt Disney Tomorrowland Adventure Series.

MALLAN, LLOYD. MAN INTO SPACE. Fawcett, 144 p., illus., 1960. Paperback, 75 cents. An explanation of the National Aeronautics and Space Administration's program for space flight, *Project Mercury*, the X–15, and future research.

MALLAN, LLOYD. MEN, ROCKETS AND SPACE RATS. Messner, 384 p., revised 1961. $5.95. The story of the men, research projects, space vehicles, equipment, and problems concerned with space flight. This revised edition includes information on the space flights of Gagarin and Shepard.

MALLAN, LLOYD. SPACE SATELLITES. Fawcett, 144 p., illus., 1958. Paperback, 75 cents. The story of the origin of America's earth satellite program and how eventually it will affect our lives.

MARCUS, ABRAHAM and REBECCA MARCUS. TOMORROW THE MOON! Prentice-Hall, 150 p., illus., 1959. $3.50. A capsule guide to space exploration answering many questions about space flight and exploration of the moon.

MARSHACK, ALEXANDER. THE WORLD IN SPACE. Nelson, 176 p., illus., 1958. $4.95. Available in paper covers from Dell, 35 cents. The scientific facts behind today's space exploration headlines, and a discussion of the accomplishments of the International Geophysical Year.

MOFFAT, SAMUEL, and JOSHUA LEDERBERG. SPACE BIOLOGY (tentative title). Scholastic, 128 p., illus., Paperback, 50 cents. Available in 1962. How the biological sciences are contributing to our knowledge of space. Life on other planets and the problem of contaminating our neighbors in space with earth-derived organisms are discussed.

MOORE, PATRICK. BOYS' BOOK OF SPACE. Roy, 144 p., illus., revised 1959. $2.75. Problems and challenges of tomorrow in space.

MOORE, PATRICK. EARTH SATELLITES. Norton, 157 p., illus., revised 1958. $3.95. The satellite program as it affects science, politics, and the future of man.

MYRUS, DON. THE ASTRONAUTS: THE TRUE STORY OF MAN'S GREATEST ADVENTURE IN OUTER SPACE. Grosset, 96 p., illus., 1961. $1.95. Available also from Noble in special binding for schools and libraries, $3.67. A well-illustrated account of the training of our seven astronauts.

NEWELL, HOMER E. SPACE BOOK FOR YOUNG PEOPLE. Whittlesey, 114 p., illus., revised 1960. $2.95. An explanation of earth and its position in the universe, including a presentation of facts about rockets, space, and space travel.

NEWELL, HOMER E. WINDOW IN THE SKY. McGraw-Hill, 116 p., illus., 1959. $2.75. The story of our upper atmosphere— its composition and interesting phenomena.

ODISHAW, HUGH. SPACE SCIENCE SERVES MAN (tentative title). Scholastic, 128 p., illus. Paperback, 50 cents. Available in 1962. Discusses the impact of space research on society and the changes that will result from information gleaned from satellites and space probes.

PARKER, BERTHA MORRIS. SATELLITES AND SPACE TRAVEL. Row Peterson, 36 p., illus., 1961. Paperback, 52 cents. Why satellites remain in orbit, the meaning of escape velocity, with coverage of *Project Mercury*, space stations, and the training and equipment of our astronauts.

POOLE, LYNN. YOUR TRIP INTO SPACE. Whittlesey House, 224 p., illus., revised, 1958. $2.95. Scientific findings on what space travel will mean to the layman.

POSIN, DANIEL Q. OUT OF THIS WORLD. Hawthorn, 180 p., illus., 1959. $3.95. Book version of the CBS–TV show explaining in narrative style and in humorous line drawings the fundamentals of space flight and astronomy.

REINFELD, FRED. WHAT'S NEW IN SCIENCE. Sterling, 200 p., illus., 1960. $3.95. Discusses recent advances in astronomy, astronautics, rocketry, electronics, as well as in medicine, genetics, biology, atomics, etc.

RICHARDSON, ROBERT S., and CHESLEY BONESTELL, editors. MAN AND THE MOON. World, 168 p., illus., 1961. $6.50. An anthology of essays by experts in astronomy, geophysics, mining, engineering, and rocketry introducing the layman to the most exciting scientific adventure of all time.

ROSS, FRANK, JR. SPACE SHIPS AND SPACE TRAVEL. Lothrop, 218 p., illus., revised 1961. $3. The development of space travel and the ships now being built to navigate in outer space.

RUSSELL, JOHN L., JR. DESTINATION: SPACE. Popular Mechanics, 160 p., illus., 1959. Paperback, 75 cents. Well illustrated explanations of rockets, missiles, space exploration efforts, etc. Includes a glossary.

SCHNEIDER, LEO. SPACE IN YOUR FUTURE. Harcourt, 255 p., illus., 1960. $3.75. Clear and concise descriptions of our physical world, the universe around us, and the strides we are making in space exploration.

SHELTON, WILLIAM ROY. COUNTDOWN: THE STORY OF CAPE CANAVERAL. Little Brown, 185 p., illus., 1960. $3.50. The great rockets, and details of life at Canaveral.

SIMONS, DAVID G. with DON A. SCHANCHE. MAN HIGH. Doubleday, 262 p., 1960. $4.50. A personal account of a record breaking balloon ascent that nearly ended in disaster. Facts gathered from this feat were used in selecting the *Project Mercury* astronauts.

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SPILHAUS, ATHELSTAN. SATELLITE OF THE SUN. Viking, 119 p., illus., 1958. $3.50. An introduction to geophysics and the relation of earth to space. Includes chapters on exploring space, rockets, satellites, and space vehicles.

STAMBLER, IRWIN. SPACE SHIP: THE STORY OF THE X-15. Putnam, 48 p., illus., 1961. $2.50. A concise and illustrated explanation of the experimental rocket ship X-15—how it developed, the men who fly it, and what it hopes to accomplish.

STEVENS, ROBLEY D. SPACE TRAVEL GUIDEBOOK. Wilde, 148 p., illus., 1961. $4.95. An illustrated history of space exploration.

THOMAS, SHIRLEY. MEN OF SPACE. Vol. 1. Chilton, 235 p., illus., 1960. $3.95. Biographies of ten men who made possible major advances in space flight, including Ehricke, Goddard, Schriever, Stapp, Van Allen, von Braun, von Karman, Tsiolkovsky, von Neumann, and Yaeger. The first of a projected series of 13 volumes.

THOMAS, SHIRLEY. MEN OF SPACE. Vol. 2. Chilton, 238 p., illus., 1961. $3.95. The second volume in a projected series of 13 including profiles on Crossfield, Dornberger, Dryden, Dixon, Lovelace, Pickering, Ramo, Teller, Truax, and Whipple.

TREGASKIS, RICHARD. X-15 DIARY: THE STORY OF AMERICA'S FIRST SPACE SHIP. Dutton, 317 p., illus., 1961. $4.95. The story of the rocket ship X-15, its builders, its test pilots, and its achievements.

TRINKLEIN, F. E., and C. M. HUFFER. MODERN SPACE SCIENCE. Holt, Rinehart, and Winston, 538 p., illus., 1961. $4.96. A textbook for the study of space science based on astronomy but drawing upon all other fields of science related to space exploration. Teacher's manual, tests, and keys are also available.

WAINWRIGHT, LOUDON and the SEVEN ASTRONAUTS. THE ASTRONAUTS. Golden, 96 p., illus., 1961. $2.99. The astronauts, in conjunction with LIFE Magazine, describe their training under *Project Mercury*.

WEISER, WILLIAM J. THE SPACE GUIDEBOOK. Coward-McCann, 322 p., illus., 1960. $4.75. A question-and-answer approach explaining space, space exploration, and how science is being applied to the conquest of space.

WELMERS, EVERETT T. THRUST INTO SPACE (tentative title). Scholastic, 128 p., illus. Paperback, 50 cents. Available in 1962. Discusses launching vehicles and propulsion systems for planetary and interplanetary space flight.

WILLIAMS, BERYL and SAMUEL EPSTEIN. THE ROCKET PIONEERS ON THE ROAD TO SPACE. Messner, 241 p., illus., revised 1958. $3.75. The story of the great rocket pioneers, their dreams, and achievements in the development of rockets. Introduction by Dr. Wernher von Braun.

YATES, RAYMOND F., and M. E. RUSSELL. SPACE ROCKETS AND MISSILES. Harper, 329 p., illus., 1960. $3.50. A complete picture in words and photographs of the rockets and missiles in today's and tomorrow's news. Glossaries and a table of satellite launchings and space probes are included.

ZAREM, LEWIS. NEW DIMENSIONS OF FLIGHT. Dutton, 256 p., illus., 1959. $4.50. Our efforts and accomplishments in advanced aviation and space exploration, with explanations of the principles, concepts, and vehicles involved. The role of man in the space age is emphasized.

Section 2—Astronomy

Books in this section deal with facts and theories about our solar system, the sun, planets, comets, meteorites, the universe, stars, constellations, and galaxies; telescopes, the computation of time as it relates to astronomy, star maps and charts, and the history of astronomy.

ADLER, IRVING. THE SUN AND ITS FAMILY. Day, 128 p., illus., 1958. $3. The history of astronomy as it relates to the sun and our solar system.

ASIMOV, ISAAC. THE CLOCK WE LIVE ON. Abelard-Schuman, 160 p., illus., 1959. $3. Relates the measurement of time to the solar system and discusses the evolution of the calendar.

ASIMOV, ISAAC. THE DOUBLE PLANET. Abelard-Schuman, 158 p., illus., 1960. $3. The story of the relationships between the earth and the moon.

ASIMOV, ISAAC. THE KINGDOM OF THE SUN. Abelard-Schuman, 160 p., illus., 1960. $3. A description of the structure of the solar system and the story of man's discoveries of his universe.

BAKER, RACHEL and JOANNA BAKER MERLEN. AMERICA'S FIRST WOMAN ASTRONOMER: MARIA MITCHELL. Messner, 186 p., 1960. $2.95. The life story of a famous woman astronomer.

BONDI, HERMANN. THE UNIVERSE AT LARGE. Doubleday, 155 p., illus., 1960. Paperback, 95 cents. A series of articles from *The Illustrated London News* giving the reader a tour of the universe as viewed by a distinguished mathematician.

BRANLEY, FRANKLYN M. EXPERIMENTS IN SKY WATCHING. Crowell, 111 p., illus., 1959. $3.50. An introduction to the observation of the sky.

BRANLEY, FRANKLYN M. THE MOON: EARTH'S NATURAL SATELLITE. Crowell, 110 p., illus., 1960. $3.50. An explanation of moon travel, eclipses, motion, orbits, mass, density, atmosphere, surface features, and temperatures of the moon.

CALDER, NIGEL. RADIO ASTRONOMY. Roy, 68 p., illus., 1959. $2.50. An introduction to radio astronomy and a discussion of the sources of stellar radiation.

CALLATAY, VINCENT DE. ATLAS OF THE SKY. St. Martin's Press, 160 p., illus., 1958. $12.50. An aid to the amateur in identifying and locating constellations and stars. The stars represented on the 36 plates included in the book are those that are visible to the naked eye on a clear moonless night. Thus, the atlas can be used by a person having no optical aid.

CAVANAUGH, JOHN M. INTRODUCTION TO SPACE AGE ASTRONOMY. Educational Services, 166 p., illus., 1960. Paperback, $2.75. A basic nontechnical textbook, well illustrated and highly readable. A workbook is included.

CHAMBERLAIN, JOSEPH M., and THOMAS D. NICHOLSON. PLANETS, STARS, AND SPACE. Creative, 216 p., illus., 1957. $7.75. An illustrated, nontechnical explanation of the earth, planets, stars, and the universe. Prepared in cooperation with The American Museum of Natural History.

CLASON, CLYDE B. EXPLORING THE DISTANT STARS. Putnam, 384 p., illus., 1958. $5. A layman's book on astronomy revealing how astronomers through the ages have reached their conclusions about the nature of stars and the universe. Basic information.

COX, DON, and *MICHAEL STOIKO*. MAN IN THE UNIVERSE. Holt, Rinehart & Winston, 64 p., illus., 1959. $2.95. Explanation of the solar system, with charts.

CYR, DONALD. MARS REVISITED. Dorrance, 131 p., illus., 1959. $3. Explanation of a theory about the curious markings on Mars.

EVANS, I. O. DISCOVERING THE HEAVENS. Roy, 198 p., illus., 1958. $3. An introduction to the history and techniques of astronomy. Information on telescopes, calendars, planets, stars, etc. for junior astronomers.

GAMOW, GEORGE. THE MOON. Abelard-Schuman, 127 p., illus., revised 1959. $2.75. Essential facts about the origin, composition, surface features, and orbit of the moon; and an explanation of its relation to earth.

HEUER, KENNETH. AN ADVENTURE IN ASTRONOMY. Viking, 127 p., illus., 1958. $3.50. The sky as seen from various cities around the world.

HOWARD, NEALE E. HANDBOOK FOR OBSERVING THE SATELLITES. Crowell, 136 p., illus., 1958. $3.50. Information for those who are interested in watching for artificial satellites. Instructions for making or using simple telescopes.

HOWARD, NEALE E. STANDARD HANDBOOK FOR TELESCOPE MAKING. Crowell, 326 p., illus., 1959. $5.95. A guide to help the amateur astronomer make a perfect mirror and a good telescope.

HOYLE, FRED. THE NATURE OF THE UNIVERSE. Harper, 141 p., illus., revised 1960. $3. A complex subject explained in simple terms.

HYNEK, ALLEN, and NORMAN ANDERSON. INTRODUCTION TO SPACE (tentative title). Scholastic, 128 p., illus. Paperback, 50 cents. Available in 1962. Discusses the nature of the universe; astronomy and cosmology.

KING, H. C. ASTRONOMY. Watts, 256 p., illus., 1960. $4.95. The history of astronomy, the development of the telescope, and space travel are presented in clear terms for the layman.

LOVELL, A. C. B. THE INDIVIDUAL AND THE UNIVERSE. Harper, 111 p., illus., 1959. $3. A foremost astronomer discusses cosmology, the work of early scientists, and the theories of modern astronomers. A collection of six lectures broadcast by the British Broadcasting System.

MALLAN, LLOYD. A GUIDE TO ASTRONOMY. Fawcett, 145 p., illus., 1958. Paperback, 75 cents. A profusely illustrated explanation of earth's relationship to the solar system, our universe, and the galaxies. Telescopes and radio astronomy techniques are explained in nontechnical language.

MALONEY, TERRY. THE SKY IS OUR WINDOW. Sterling 128 p., illus., 1960. $3.95. Fundamentals of astronomy and the relationships of earth, planets, solar system, galaxies, and universe to each other.

MATTERSDORF, LEO. INSIGHT INTO ASTRONOMY. Lantern, 256 p., illus., 1959. $4. Basic facts of space and time in astronomy. This revised edition reveals astronomical information received from test rockets and satellites.

MAYALL, R. NEWTON, and MARGARET W. MAYALL. A BEGINNER'S GUIDE TO THE SKIES. Putnam, 129 p., illus., 1960. $2.50. Nontechnical information for the interested novice, including star maps and constellation diagrams.

MAYALL, R. NEWTON, MARGARET MAYALL, and JEROME WYCKOFF. THE SKY OBSERVER'S GUIDE. Golden Press, 125 p., illus., 1959. $2.95. A simple and concise guide to amateur sky-watching, with charts, sky maps, and lists of objects to observe.

MOORE, PATRICK. THE BOYS' BOOK OF ASTRONOMY. Roy, 143 p., illus., 1958. $3. A complete ABC of astronomy.

MOORE, PATRICK. GUIDE TO MARS. Macmillan, 123 p., illus., revised 1958. $2.95. A nontechnical summary of all we know about this planet, for the nonspecialist.

MOORE, PATRICK. A GUIDE TO THE PLANETS. Norton, 254 p., illus., revised 1960. $6.50. A complete guide to our solar system for the general reader and the amateur astronomer.

MOORE, PATRICK. THE PLANET VENUS. Macmillan, 132 p., illus., revised 1959. $3.95. The latest discoveries and information.

MOORE, PATRICK. THE SOLAR SYSTEM. Criterion, 126 p., illus., 1961. $3. A description of the solar system and the bodies within it, and of the work of the scientists who have laid the groundwork for modern astronomy. Considerable emphasis on projects for amateur astronomers.

MOTZ, LLOYD. THIS IS ASTRONOMY. Archer, 256 p., illus., 1958. $3.95. An introduction to astronomy including the moon, sun, planets, stars and galaxies, and how the radio telescope aids us in learning about outer space.

MOTZ, LLOYD. THIS IS OUTER SPACE. Archer, 199 p., illus., 1960. $4.95. Explains the basic features of Einstein's theory of relativity. Discusses extragalactic space, how stars came into being, and their composition.

NEAL, HARRY EDWARD. THE TELESCOPE. Messner, 192 p., illus., 1958. $3.50. The story of astronomers who developed the telescope. Includes instructions for making a simple telescope, and lists sources of materials, publications, and amateur societies.

NOURSE, ALAN E. NINE PLANETS: ASTRONOMY FOR THE SPACE AGE. Harper, 320 p., illus., 1960. $5.95. A tour of the planets in which the author evaluates all the theories regarding their unknown conditions.

OLCOTT, W. T. and R., and M. MAYALL. FIELD BOOK OF THE SKIES. Putnam, 482 p., illus., revised 1954. $5. A completely revised edition of the book which has been the standard work of its kind since its first appearance.

PAGE, LOU WILLIAMS. A DIPPER FULL OF STARS. Follett, 223 p., illus., revised 1959. $2.95. An introduction and guide to the sky for young people.

PARKER, BERTHA MORRIS. THE EARTH'S NEAREST NEIGHBOR. Row Peterson, 35 p., illus., 1959. Paperback, 52 cents. An imaginary visit to the moon introduces the student to conditions on the moon. The moon's influence on earth and eclipses are also discussed.

PARKER, BERTHA MORRIS. THE SUN AND ITS FAMILY. Row Peterson, 35 p., illus., 1958. Paperback, 52 cents. The sun and its influence are described in relation to the nine planets of our solar system.

PICKERING, JAMES S. CAPTIVES OF THE SUN. Dodd Mead, 352 p., illus., 1961. $4.95. The nature of space, the moon, planets, and our solar system.

PICKERING, JAMES S. 1001 QUESTIONS ANSWERED ABOUT ASTRONOMY. Dodd Mead, 420 p., illus., 1958. $6. Also available in soft covers from Grosset, $2.45. Answers to more than a thousand key questions about planets, satellites, comets, etc., including also biographies of famous astronomers.

REED, W. MAXWELL. THE STARS FOR SAM. Harcourt, 179 p., illus., revised 1960. $4.95. An introduction to astronomy, including our solar system, the universe and its galaxies, and space exploration today.

SHAPLEY, HARLOW. OF STARS AND MEN. Beacon, 157 p., 1958. $3.50. Paperback edition available from Washington Square Press, 50 cents. A presentation of new and old information and ideas on man's position in the universe; and essay on orientation.

STERNIG, J. BEGINNER'S BOOK OF ASTRONOMY. McBride, 162 p., illus., 1958. $3.75. A "first book" explaining in simple terms our solar system, the universe and galaxies, and how they are related to space travel.

STOKLEY, JAMES. ATOMS TO GALAXIES. Ronald, 351 p., illus., 1961. $6. Modern astronomy—its methods, findings, theories, and relation to space flight.

TANNENBAUM, BEULAH, and MYRA STILLMAN. UNDERSTANDING TIME. Whittlesey, 143 p., illus., 1958. $3. An explanation of all the major devices for recording time, and their relation to astronomy.

THOMAS, HENRY. COPERNICUS. Messner, 192 p., 1960. $2.95. The biography of the founder of modern astronomy.

WHIPPLE, FRED L. EARTH, MOON AND PLANETS. Grosset, 293 p., illus., 1958. $2.95. Basic facts of our solar system to help understand the space age.

Section 3—How Jets, Rockets, and Satellites Operate

Books in this section explain the operation of jet and rocket engines, missiles, and satellites; and rocket safety measures.

AHNSTROM, D. N. THE COMPLETE BOOK OF JETS AND ROCKETS. World, 159 p., illus., revised 1959. $4.95. An overview of jet and rocket propulsion, including their applications to aviation and space exploration.

BRINLEY, BERTRAND R. ROCKET MANUAL FOR AMATEURS. Ballantine, 328 p., illus., 1960. Paperback, 75 cents. A complete handbook for amateur rocketeers covering designing and testing rockets, preparing rocket fuels, and safe firing procedures.

BURGESS, ERIC. SATELLITES AND SPACEFLIGHT. Macmillan, 159 p., 1958. $4.50. The construction, instrumentation, launching procedures, transmission of data, and flight orbit of earth satellites.

DAVIS, CLIVE E. MESSAGES FROM SPACE. Dodd Mead, 96 p., illus., 1961. $2.75. A nontechnical explanation of how the wizardry of electronics controls missiles, launches space vehicles and satellites, relays information to earth, and collects, stores, and reports "messages from space."

JAMES, G. S. ROCKET BUILDING FOR STUDENTS. Rocket Research Institute, 80 p., illus., 1958. *Out of print.* A manual describing the basic training devices developed by the Rocket Research Institute to demonstrate rocket safety for amateur rocketeers.

MARK, DAVID. ALL ABOUT MISSILES AND SATELLITES. Cowan, 96 p., illus., 1959. Paperback, $1.50. Thirty-eight major missiles and their payloads, launching and tracking systems are discussed. Topics include nose cones, propulsion, guidance, satellites, and space travel.

MEHRENS, H. E. THE DAWNING SPACE AGE. Civil Air Patrol, 224 p., illus., 1959. Paperback, $2. An explanation of the rocket, its components, and its applications; propulsion and guidance systems, military missiles and research vehicles; and problems of space flight and their solutions.

MUNROE, KENNETH. A GUIDE TO UNDERSTANDING JETS, ROCKETS, AND SATELLITES. Walch, 25 p., illus., 1961. Paperback, $1. Basic information on high speed propulsion and satellite behavior including formulae and problems of interest to the amateur rocketeer.

NEWELL, HOMER E. GUIDE TO ROCKETS, MISSILES, AND SATELLITES. Whittlesey, 54 p., illus., 1958. $2.50. An explanation of rocket and missile research, including an alphabetical list and photographs of rockets, satellites, and missiles of today.

OVENDEN, MICHAEL W. ARTIFICIAL SATELLITES. Penguin, 126 p., illus., 1961. Paperback, $1.25. An illustrated explanation of the mechanics of artificial satellites, space probes, and rockets.

PARKER, BERTHA MORRIS. ROCKETS AND MISSILES. Row Peterson, 36 p., illus., 1961. Paperback, 52 cents. How rockets and missiles work, the distinction between the two, their structures, and kinds of propellants are explained. Includes sections on jet propulsion and missile guidance, and the uses of rockets in research.

PARKIN, CHARLES M., JR. THE ROCKET HANDBOOK FOR AMATEURS. Day, 306 p., illus., 1959. $5.95. An illustrated guide to the safe construction, testing, and launching of model rockets.

SARGEANT, CHARLES. HOW TO DRAW ROCKETS AND SPACESHIPS. Viking, 64 p., illus., 1958. $1.75. Illustrations with brief text indicating the shape, functions, and equipment of modern rockets.

STINE, G. HARRY. ROCKET POWER AND SPACE FLIGHT. Holt, Rinehart and Winston, 180 p., illus., 1957. $3.75. A discussion of rockets and space flight giving answers to many questions young people have asked.

TAYLOR, JOHN W. R. ROCKETS AND SATELLITES WORK LIKE THIS. Roy, 71 p., illus., 1959. $2.75. Explains rocket propulsion, guidance systems, and the problems of placing satellites in orbit.

Section 4—Weather

Books in this section cover the nature and causes of weather phenomena, methods of weather forecasting, cloud formations, and the history of meteorology.

BATTAN, LOUIS J. THE NATURE OF VIOLENT STORMS. Doubleday, 158 p., illus., 1961. Paperback, 95 cents. An interesting study of weather disturbances and the problems involved in their prediction.

BELL, THELMA HARRINGTON. THUNDERSTORM. Viking, 128 p., illus., 1960. $3. The historical and scientific background of thunderstorms.

CAMPBELL, ETHEL M. THE WIND—NATURE'S GREAT VOICE. Denison, 45 p., illus., 1959. $3. Explanations of the movements of the atmosphere.

FISHER, ROBERT MOORE. HOW ABOUT THE WEATHER? Harper, 186 p., illus., revised 1958. $3.75. A paperback edition under the title HOW TO KNOW AND PREDICT THE WEATHER is available from Signet Books, 50 cents. A simple explanation of the causes of rain, snow, storms, clear weather, fog, and tornadoes. The interpretation of weather maps and simple weather forecasting techniques are also included.

FORRESTER, FRANK H. 1001 QUESTIONS ANSWERED ABOUT THE WEATHER. Dodd Mead, 419 p., illus., 1957. $6. Also available in soft covers from Grosset, $2.45. Every important aspect of the weather in question and answer form is presented for quick and easy reference.

LEY, WILLY. MAN AND WEATHER SATELLITES. Singer, 48 p., illus., 1959 Paperback, 60 cents. The story of man and the weather, what he has learned about it, and how he hopes to learn even more through the use of satellites. Walt Disney Tomorrowland Adventure Series.

ORR, CLYDE, JR. BETWEEN EARTH AND SPACE. Macmillan, 253 p., illus., 1959. $4.95. An authoritative study of the world's atmosphere—explaining weather, climate, space, and supersonic flight.

PARKER, BERTHA MORRIS. ASK THE WEATHERMAN. Row Peterson, 35 p., illus., 1959. Paperback, 52 cents. An introduction to weather forecasting including descriptions of the various instruments used by the weatherman.

SCORER, R. S. WEATHER. Roy, 57 p., illus., 1959. $2.50. An explanation of familiar weather phen mena, with emphasis on new research in the upper atmosphere. Information on meteorological careers is included.

SPAR, JEROME. THE WAY OF THE WEATHER. Creative, 224 p., illus., 1957. $7.75. An illustrated overview of weather phenomena and climate. Prepared in cooperation with The American Museum of Natural History.

Section 5—Aviation and Aeronautics

Books in this section are concerned with aircraft, aviation history, careers, theory of flight, and helicopters.

BERNARDO, JAMES V. AVIATION IN THE MODERN WORLD. Dutton, 352 p., 1960. $5.95. A comprehensive survey of the airplane and its social, economic, and political impacts and implications. Includes discussions of the principles of flight, the mechanics and art of flying, weather, space flight, history of flight, and career opportunities.

BRYAN, LESLIE A. and others. FUNDAMENTALS OF AVIATION AND SPACE TECHNOLOGY. Institute of Aviation, 140 p., illus., 1959. $2.25. A basic textbook for beginning student pilots.

COOKE, DAVID C. FLIGHTS THAT MADE HISTORY. Putnam, 70 p., illus., 1961. $2.50. A picture story of 37 history making flights from the first Wright brothers' flight to the B–52 world circling non-stop flight in 1957.

COOKE, DAVID C. JET AND ROCKET PLANES THAT MADE HISTORY. Putnam, 72 p., illus., 1961. $2.50. Photographs and comments concerning manned jet and rocket aircraft from the first rocket flights in 1929 to the X–15 research rocket plane.

DOHM, JOHN, editor. THE NEW PRIVATE PILOT. Pan American Navigation Service, 301 p., illus., revised 1961. Paperback, $5. Basic background information for the student pilot, and aids in preparing for the written examination for certification as a private pilot.

DUKE, NEVILLE and EDWARD LANCHBERRY, editors. THE SAGA OF FLIGHT. Day, 406 p., 1961. $5.95. An anthology of writings of aviation pioneers and heroes.

EDITORS OF YEAR. FLIGHT. Year, 256 p., illus., 1961. $7.95. More than 1,000 photographs giving a picture history of aviation, including the beginnings of space flight.

FEDERAL AVIATION AGENCY. PILOT INSTRUCTION MANUAL. Hanover House, 146 p., illus., 1961. $3.50. The official flight instruction manual of the FAA, for all pilots and would-be pilots who wish to learn to fly.

FLOHERTY, JOHN J. and MIKE MCGRADY. WHIRLING WINGS. Lippincott, 156 p., illus., 1961. $3. The story of the helicopter and the men responsible for its invention and development.

O'CONNOR, MARY. FLYING MARY O'CONNOR. Rand, 144 p., illus., 1961. $2.50. An autobiography of a pioneer air hostess which gives a vivid picture of the changes and developments in air travel and the training of stewardesses from the early airline days to the present.

SCHNEIDER, LEO and MAURICE U. AMES. WINGS IN YOUR FUTURE. Harcourt, 146 p., illus., revised 1960. $2.95. An explanation of the principles of flight, including information on jets and space flight, with suggested experiments and explanatory diagrams.

SUNDERMAN, JAMES F., editor. EARLY AIR PIONEERS: 1863–1935. Watts, 256 p., illus., 1961. $4.95. An anthology of more than 45 articles giving intimate glimpses into the experiences of aviation's pioneers.

TOWER, MERRILL E. FLIGHT FACTS FOR PRIVATE PILOTS. Aero, 212 p., illus., 1960. $5. Available also in paper covers at $3.50. Fundamentals of flying for student pilots and an excellent review for seasoned pilots of light aircraft.

U.S. AIRCRAFT, MISSILES, and SPACECRAFT. National Aviation Education Council, 156 p., illus., 1961. Paperback, $1.50. An annual pictorial review of all aircraft, missiles, rockets, and space vehicles in production or in the testing stages. Includes three-view drawings, specifications, and performance ratings. Yearbooks for 1957 through 1960 are also available. Write for prices.

WRIGHT, ORVILLE. HOW WE INVENTED THE AIRPLANE. Edited and with commentary by Fred C. Kelly. McKay, 78 p., illus., 1953. $2. Paperback edition, $1. Orville Wright tells in his own words the story of how he and his brother Wilbur invented the airplane. The best detailed, step-by-step account of the process of invention that lifted man into the skies on wings.

PART II—REFERENCE MATERIALS

Bibliographies

THE AAAS SCIENCE BOOK LIST. Hilary J. Deason, editor. American Association for the Advancement of Science, 140 p., 1959. Paperback, $1. An annotated bibliography designed as a "guide to recreational and collateral reading, and to basic reference works in the sciences and mathematics for junior and senior high school students, college undergraduates, and nonspecialist adults." Many titles on astronomy, space flight, and meteorology are included.

AN INEXPENSIVE SCIENCE LIBRARY. Hilary J. Deason and Robert W. Lynn. American Association for the Advancement of Science, 87 p., 1961. Paperback, 25 cents. A selected annotated list of paperbound science and mathematics books for junior and senior high school pupils, college students, and adults. Many aviation, astronomy, meteorology, and space titles are included.

MISSILES, ROCKETS, AND SPACE VEHICLES, 1959–1960. Superintendent of Documents, U.S. Government Printing Office, Cat. D 101.22:70–5–7. Contains hundreds of unclassified titles keeping pace with the accelerated efforts of the U.S. missile and space programs, both current and planned, and encompassing the broader aspects of space exploration. $1.

SPACE FLIGHT LITERATURE. Frederick I. Ordway, III, editor. Space Publications, 45 p., revised 1961. $3.95. An annotated list of books published over the last 30 years, of interest to high school students and adults.

THE TRAVELING HIGH SCHOOL SCIENCE LIBRARY. Hilary J. Deason. American Association for the Advancement of Science, 61 p., 1959. Paperback, 25 cents. An annotated list of books included in the traveling Science Library Program of the National Science Foundation. Titles on space flight, aviation, astronomy and meteorology are included.

Dictionaries

AERONAUTICAL DICTIONARY. Frank Davis Adams, editor. Superintendent of Documents, U.S. Government Printing Office, Cat. NAS 1.8:Ae8. 199 p., illus., 1959. $1.75. A publication of the National Aeronautics and Space Administration listing definitions of common words and terms gathered from an extentensive search of aeronautical literature. Cross referenced.

AGARD MULTILINGUAL AERONAUTICAL DICTIONARY. G. H. Frenot and A. H. Holloway, editors. Pergamon, 1,000 p., 1960. $20. Some 2,000 aeronautical terms and their definitions in eight languages—English, French, German, Spanish, Italian, Dutch, Turkish, and Russian.

AVIATION AND SPACE DICTIONARY. Ernest J. Gentle and Charles E. Chapel, editors. Aero, 450 p., illus., revised 1961. $10. Comprehensive definitions of more than 10,000 aerospace terms.

DICTIONARY OF GUIDED MISSILES AND SPACE FLIGHT. Grayson Merrill, editor. Van Nostrand, 688 p., illus., 1959. $17.50. An encyclopedic dictionary of terms, illustrated and cross referenced.

SPACE AGE DICTIONARY. Charles McLaughlin, editor. Van Nostrand, 128 p., illus., 1959. $5.95. An illustrated dictionary of words and terms of the space age for the general reader.

Encyclopedias

LAROUSSE ENCYCLOPEDIA OF ASTRONOMY. Lucien Rudaux and G. de Vaucouleurs, editors. Putnam, 506 p., illus., 1959. $15. The first encyclopedia devoted entirely to the science of space, with more than 800 illustrations.

ROCKET ENCYCLOPEDIA ILLUSTRATED. John W. Herrick and Eric Burgess, editors. Aero, 607 p., illus., 1959. $12.50. A comprehensive collection of definitions and illustrated explanations relating to the science of rocketry. For the layman as well as for the technician and engineer.

SPACE ENCYCLOPEDIA, THE. Sir Harold Spencer Jones, et al. Dutton, 288 p., illus., revised 1960. $8.95. More than 700 entries dealing with satellites, rockets, guided missiles, stars, our solar system, radio astronomy, and space medicine.

Miscellaneous reference materials

AERONAUTICS AND ASTRONAUTICS 1915–60. Eugene M. Emme. Superintendent of Documents, U.S. Government Printing Office, 240 p., 1961. $1.75. A chronological list of achievements in scientific research and engineering developments which lie behind the major milestones in man's conquest of the air and space. Appendices include a log of earth satellites and space probes through 1960, world airplane records, balloon flights, and recipients of major aeronautics and astronautics awards and honors over the years. A publication of the National Aeronautics and Space Administration.

AEROSPACE FACTS AND FIGURES. Ben S. Lee, editor. American Aviation Publications, 160 p., illus., 1961. $2. An annual statistical and textural reference covering the aerospace industry in the U.S.

INTERAVIA ABC. *World Directory of Aviation and Astronautics*, 9th edition. Interavia, 1,325 p., $12. Approximately 25,000 listings covering the world's

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airlines aerospace manufacturers, airports, government agencies, aviation clubs and organizations, schools, periodicals, equipment manufacturers, and many other segments of the aerospace industry.

JANE'S ALL THE WORLD'S AIRCRAFT. L. Bridgeman, McGraw-Hill, 574 p., illus., 1961. $35. The well-known compendium of aircraft and missile data of the world.

THE 1961 AEROSPACE YEAR BOOK. American Aviation Publications, 481 p., illus., 1961. $10. The official publication of the Aerospace Industries Association giving a complete pictorial review and chronology of the outstanding aerospace events in 1960; photographs, descriptions, and three-view drawings of all U.S. civil and military aircraft, spacecraft, and missiles in production; and summaries of U.S. airline operations and aerospace manufacturing.

WHO'S WHO IN WORLD AVIATION AND ASTRONAUTICS. American Aviation Publications, 497 p., 1958. $12.50. Supply limited. More than 2,400 entries giving information about living men and women contributing to aviation and astronautics today.

WORLD AVIATION DIRECTORY. Marion E. Grambow, editor. American Aviation Publications, approximately 1,150 p., published semiannually. $12. A standard reference listing the addresses and officials of the free world's aerospace manufacturers, airlines, periodicals, organizations, government agencies, major airports, schools and special industry services.

PART III—TEACHING AIDS

Section 1—Pamphlets, Booklets, etc.

Academy of Model Aeronautics, 1025 Connecticut Ave. NW., Washington 6, D.C.

MODEL AIRPLANE CLUB KIT Includes the *Model Airplane Club and Chapter Manual*, with organizational procedures, suggested activities, and sample constitution. Related materials also included. 25 cents.

OFFICIAL MODEL AIRCRAFT REGULATIONS. Detailed safety and competition model flying rules for gliders, rubber-powered airplanes, gas-powered airplanes, and rocket-powered airplanes. Rules for all the subdivisions of these categories are included. 25 cents.

MODEL AVIATION. AMA's monthly journal. Contains information about model airplane contests, outstanding record flights, and general information of interest to model airplane makers. $1 for one-year (12 issues) subscription. Single overrun copies free on request as long as supply lasts.

Adler Planetarium, Chicago 5, Ill.

Booklets prepared by the staff of the Adler Planetarium:

No. 2—STARS OF SUMMER. Simple star maps with brief descriptions. 10 cents.

No. 4—STARS OF WINTER. Simple star maps with brief descriptions. 10 cents.

No. 9—WHAT ARE STARS? Explains how astronomers have gathered knowledge of the stars and what they have found. 10 cents.

No. 13—THE STORY OF THE PLANETS. A brief history of man's knowledge of the planets. 10 cents.

No. 20—REPORT PREPARED BY THE COMMITTEE OF THE AMERICAN ASTRONOMICAL SOCIETY ON PREFERRED SPELLINGS AND PRONUNCIATIONS. Pronunciations and definitions of the names of constellations, and pronunciations and equivalents of 50 important special star names. 10 cents.

Lists of books, photographs, observing aids, navigational equipment and telescope mirror kits available through the Adler Planetarium. Free.

Aerospace Industries Association, 610 Shoreham Building, Washington 5, D.C.

AEROSPACE. An official publication of the AIA, giving news of developments in the aerospace industry. Published monthly. Free.

SPACE—CHALLENGE AND PROMISE. An illustrated booklet discussing briefly the history of space research, the reasons for exploring space, the next steps in space exploration, and the role of the aerospace industry. Free.

Charts, approximately 14" x 10¼" in three colors as follows:

Aeronautical Power Plants. Diagrams with explanations of the turbojet, turbojet with after burner, turboprop, piston, liquid fuel and solid fuel rocket engines. Free.

Around the World in 48 Hours. Eastbound and westbound round-the-world jet transport timetables with explanations. Free.

Shape of Flight. Airfoils and wing shapes and their particular advantages. Free.

Air Traffic Control Association, Barr Building, Washington 6, D.C.

AN INTRODUCTION TO BINARY ARITHMETIC. Explains the theory of binary arithmetic and relates it to use in data computing machines. 25 cents.

American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D.C.

CAREERS IN SCIENCE. A SELECTED BIBLIOGRAPHY FOR HIGH SCHOOL STUDENTS. Sources of career information relating to the sciences and mathematics. 1961. 15 cents.

American Association of Variable Star Observers, 4 Brattle St., Cambridge 38, Mass.

A MANUAL FOR OBSERVING VARIABLE STARS. Contains complete instructions and sample practice charts for some variable star regions, lists of star atlases, helpful astronomy books and magazines. Useful for amateur as well as for professional astronomers. $1.

American Astronomical Society, c/o Smithsonian Astrophysical Observatory, 60 Garden St., Cambridge, Mass.

A CAREER IN ASTRONOMY. A leaflet describing the qualifications and work of an astronomer, and his opportunities. Free.

American Meteorological Society, 45 Beacon St., Boston 8, Mass.

Kit of weather information. An assortment of materials including single copies of WEATHERWISE, a list of schools offering training in meteorology, a cloud chart, and a bibliography. Free. (Note: This kit will be discontinued when new educational aids are available. Write for further information.)

American Museum—Hayden Planetarium, 81st St. and Central Park West, New York 24, N.Y.

PORTRAIT OF THE UNIVERSE. A collection of photographs 6" x 6½", taken at Mt. Wilson, Palomar and Lick Observatories. $2.20.

SKY SET I—24 photographs of the solar system and galactic objects. 8½" x 11¾". $4.40.

SKY SET II—24 photographs, from collections at Mt. Wilson and Palomar, including 4 drawings of the 200" telescope. $4.40.

THE BOOK CORNER. A leaflet listing books on astronomy, navigation, and meteorology, plus sources of charts, maps, celestial globes and astronomical gadgets. Free.

American Rocket Society, 500 Fifth Ave., New York 36, N.Y.

AN OPEN LETTER TO AMATEUR ROCKETEERS. A leaflet cautioning amateur rocketeers on the hazards of rocket firing and experimentation. Free.

American Society for Engineering Education, University of Illinois, Urbana, Ill.

THE ENGINEERING TECHNICIAN. A 20-page booklet describing the education, qualifications, and work of the engineering technician. 25 cents.

Board of Education, City of New York, Publications Sales Office, 110 Livingston St., Brooklyn 1, N.Y.

NEW YORK CITY AIR AGE INSTITUTE SOURCE BOOK. (1961). A 71-page booklet describing New York City's air age education program and listing sources of free and inexpensive materials, audio-visual aids, and books for classroom use. Suitable for teachers. 50 cents.

Careers, Largo, Fla.

AERONAUTICAL ENGINEER. No. 0–19.03. An 8-page booklet describing the work of an aeronautical engineer, qualifications and training opportunities. 25 cents.

OCCUPATIONS IN SPACE EXPLORATION. Career reprint No. 0–35. A reprint from the U.S. Bureau of Labor Statistics *Occupational Outlook Quarterly* giving general facts about this expanding occupational field. 15 cents.

AERONAUTICAL DESIGN ENGINEER. Career reprint No. 0–19.03. An article describing the opportunities for women, written by a woman engineer who designs instrument panels for aircraft. 15 cents.

AIR TRAFFIC CONTROLLERS. No. 0–61. An 8-page booklet describing the qualifications, training opportunities and work of air traffic controllers. 25 cents.

Civil Air Patrol, National Headquarters, Ellington Air Force Base, Tex.

AEROSPACE AGE SCIENCE. A collection of simple-equipment experiments and activities. Suitable for teachers. Free.

AEROSPACE EDUCATION COURSE SYLLABUS. A comprehensive guide for an elective senior high school course in aerospace science. Free.

EDUCATION—AVIATION—AND THE SPACE AGE. A handbook for the teacher who wishes to bring aerospace information into the classroom. Provides an easy-to-understand overview of air and space vehicles; the uses and effects of aviation; and various methods of solving the curricular problem. 88 pages, $1.50.

DEMONSTRATION AIDS FOR AVIATION EDUCATION. Designed to help teachers demonstrate aerospace age concepts to students regardless of grade level. The demonstrations and experiments in the booklet contain materials to help the teacher introduce the natural sciences and to stimulate students to expand these modest beginnings. 75 cents.

AVIATION AND YOU. Discusses the importance of aviation; shows how it has influenced man's thinking and actions; and provides information about aviation careers. Instructor's guide and workbook are also available. 60 cents.

AIRCRAFT IN FLIGHT. Describes the basic principles of flight; explains forces affecting an aircraft in flight; points out problems of design; and shows the relationships of hydraulics and electricity to modern aircraft operation. Instructor's guide and workbook are also available. 60 cents.

POWER FOR AIRCRAFT. Describes the principles pertaining to aircraft power plant operation. Subjects include jet and piston type internal combustion engines, how engines get their fuel, and power plant electrical systems. Instructor's guide and workbook are also available. 60 cents.

NAVIGATION AND THE WEATHER. Describes the types of navigation and discusses weather as a factor in navigation. Lays a foundation for further study. Instructor's guide and workbook are also available. 60 cents.

AIRPORTS, AIRWAYS, AND ELECTRONICS. Describes the principles of airport and airway operations; explains electronic devices in airport functions,

and discusses the prevention of air traffic conflicts. Instructor's guide and workbook are also available. 60 cents.

THE PROBLEMS OF AIR POWER. Military aviation, aircraft manufacture, airline transportation, airports, research, education, and airpower are discussed. Instructor's guide and workbook are also available. 60 cents.

George F. Cram Co., 730 East Washington St., Indianapolis 16, Ind.

OUTER SPACE AND WORLD GLOBE HANDBOOK. Explanations of outer space, man's activities in the space age, the earth's place in the solar system, the measurement of time, the sun, and the planets. $1.

Crowell-Collier Publishing Co., 640 Fifth Ave., New York 19, N.Y.

ROCKETS AND SPACE VEHICLES. An illustrated 24-page booklet in two parts: Part I—"Rockets and Satellites"—provides a basic explanation of scientific laws and principles of space flight and rocket propulsion: Part II—"Space Vehicles"—is reprinted from *Collier's Encyclopedia* and discusses recent advances in space research. 50 cents.

Denoyer Geppert Co., 5235 Ravenwood Ave., Chicago 40, Ill.

SIGNPOST TO THE STARS. No. SS211. A 32-page booklet for the beginning astronomer including 20 star maps. 50 cents.

STARS AT A GLANCE. No. SG11. A pocket guide, 5"×7", containing monthly charts of the heavens. 75 cents.

STAR MAP AND FINDER. No. SF1. A kit containing a map of the northern heavens, 11"×11" showing all stars from the fourth through the first magnitude; a finder with complete directions for use, and five exercise sheets for use in mapping the sky as observed. 25 cents.

Edmund Scientific Co., 101 East Gloucester Pike, Barrington, N.J.

STAR AND SATELLITE PATH FINDER. No. S9227. A rotating chart that shows over 500 stars and their relationships at any selected day and hour. With instruction manual. 50 cents.

Catalog of surplus lens, mirrors, telescope parts, etc. Free.

MOONBALL. No. S70, 129. A three-dimensional 6" relief of the side of the moon visible from the earth. Includes facts about the moon and a complete map for identifying the surface features. $2.50

TIME IN ASTRONOMY. No. 9054. An 18-page illustrated booklet giving instructions for conversion from mean to standard time. Explains sidereal time and includes star positions, date scales, sky charts, and instructions for using setting circles. 60 cents.

HOW TO USE YOUR TELESCOPE. No. 9055. A 32-page booklet explaining the use of astronomical telescopes. Ideal for the beginner. 60 cents.

STAR TIME CALCULATOR. No. 40,399. A slide rule that makes the conversion from star or sidereal time to standard time automatically. $1.50

Engineers' Council for Professional Development, 345 E. 47th St., New York 17, N.Y.

AFTER HIGH SCHOOL—WHAT? A folder discussing careers in engineering and science. 3 cents. 500 cp. for $10.

ENGINEERING—A CREATIVE PROFESSION. A booklet describing the various kinds of engineering fields and training opportunities. 25 cents.

Federal Aviation Agency, Aeronautical Reference Branch, Washington 25, D.C.

THE FEDERAL AVIATION AGENCY. A booklet describing the background and history of FAA—its organization, aims, and functions. Free.

SOME ABC's OF AIR TRAFFIC MANAGEMENT. A booklet giving a brief description of the FAA system of air traffic management, its problems, and what is being done to solve them. Free.

GLOSSARY OF AIR TRAFFIC CONTROL TERMS. Free.

FAA PUBLICATIONS. A list of publications available at FAA and at the U.S. Government Printing Office. Free.

Field Enterprises Educational Corporation, Merchandise Mart Plaza, Chicago 54, Ill.

SPACE TRAVEL AND GUIDED MISSILES. No. SA–1794. A reprint of two articles from *The World Book Encyclopedia*. 25 cents.

Teaching unit on WEATHER. No. SC–2016. Adaptable to all grades. Elements of weather, causes and effects, weather patterns, and predictions. 25 cents.

Flight Safety Foundation, 468 Park Ave. South, New York 16, N.Y.

DESIGN FOR SAFETY. A booklet illustrating aircraft design errors and corrections. Also includes a

compilation of Human Factors Bulletins dealing with human limitations for flight operations. 50 cents.

THE COMMON MAN—UP IN THE AIR. A study of the psychology of passenger reactions in flight. 25 cents.

Franklin Institute, Philadelphia 3, Pa.

A brief list of books and pamphlets on sale at the Book Counter at Franklin Institute but which are also available by mail. Topics include astronomy, how to make telescopes, star maps, moon maps, space exploration, etc. Many of the booklets and pamphlets are difficult to find elsewhere. Book list is free.

C. S. Hammond and Company, Maplewood, N.J.

SPACE KIT. Includes a 29" x 42" chart of the entire solar system, illustrations of space vehicles, and a wheel giving answers to questions about the planets. $1.

HANDY STAR FINDER AND PLANET TABLES. Has a simplified Star Finder Wheel showing all principal fixed stars and planets visible at any hour of the year in the northern hemisphere. Planet tables are included. $1.

House of Representatives, Committee on Science and Astronautics, Room 214B, New House Office Building, Washington 25, D.C.

Reports and hearings of the Select Committee on Astronautics and Space Exploration, 85th Congress, 2nd session.

THE NATIONAL SPACE PROGRAM. Information gathered from military, scientific and industrial sources relating to the possibilities of establishing a national space agency. May, 1958. (Note: This report is now *out of print*. Consult your local library for file copies.)

THE NEXT TEN YEARS IN SPACE. A summary of the thinking of leading scientists, engineers, industrialists, military officials, and government administrators, giving their assessments of technological probabilities for the period 1960–1970. Free.

SPACE PROPULSION. Hearings before the Committee on propulsion systems for space exploration. Discussions concerning rocket engines, rocket engine clusters, nuclear rocket engines, ion engines, etc. March 1959. Free.

SURVEY OF SPACE LAW. A survey of current laws as they apply to space, and a consideration of a code of laws for outer space regarding the rights, obligations, and relations of nations in the use of outer space December 1958. Free.

INTERNATIONAL COOPERATION IN THE EXPLORATION OF SPACE. The problems of and the opportunities for international cooperation in the exploration of space. January 1959. Free.

THE U.S. AND OUTER SPACE. Principal accomplishments of the Select Committee on Astronautics and Space Exploration, and recommendations with respect to the national space program. January 1959. Free.

LIFE SCIENCES AND SPACE. Report No. 2227. A report on hearings held June 15–16, 1960 to explore the need for civilian space medicine programs, the facilities and talents existing for carrying on such programs, and the various ways of using these programs. Free.

Institute of the Aerospace Sciences, Student Activities, 2 East 64th St., New York 21, N.Y.

YOUR CAREER AS AN AERO/SPACE ENGINEER. An illustrated booklet discussing the responsibilities and rewards of a career as a professional aero/space engineer. Job descriptions, challenges that lie ahead for both the industry and the engineer, preparing for college, tuition costs, a typical aeronautical engineering curriculum, and a list of accredited schools of engineering are also included. Single copy free.

International Air Transport Association, Public Relations Office, 1060 University St., Montreal 3, Canada.

WORLD AIR TRANSPORT STATISTICS. An annual compendium of statistics about the world air transport system including operating statistics of IATA member airlines, cumulative industry statistics of civil air transport, North Atlantic air traffic statistics for the years since 1950, and IATA Clearing House statistics. Ask for latest edition. Free.

International Civil Aviation Organization, International Aviation Building, Montreal, Canada

Exhibition picture set. A set of 8 posters in color, 14" x 18", with legends in English, French or Spanish, telling the story of ICAO. $2 per set.

INTERNATIONAL CIVIL AVIATION ORGANIZATION. A trilingual (English, French and Spanish) pamphlet describing the work of ICAO. Free.

Junior Engineering Technical Society, Rm. 1378, 345 E. 47th St., New York 17, N.Y.

AMATEUR ROCKETEERING IN THE CENTRAL MICHIGAN AREA. A history of the Central Michigan Rocket Society that also serves as a guide to amateur rocketeers. Includes proposed bylaws, sample registration form for a rocket-launching expedition. Free.

JETS JOURNAL. The official publication of The Junior Engineering Technical Society, Inc. The May 12, 1961 issue is devoted to space technology. 25 cents per copy.

The Macmillan Company, 60 Fifth Ave., New York 11, N.Y.

MOON MAPS. Hugh P. Wilkins. 27 maps reproduced to the scale of 55.4 miles to the inch, suitable for telescope use. 8" x 8". $6.75.

Markhart Educational Service, Preston, Idaho

AEROSPACE WORD POWER. A 95-page booklet containing more than 800 space age terms with definitions. To help with mastery of the language of the space age, self-testing devices are included. $2 clothbound; $1 in paper covers.

Maryland Academy of Sciences, Enoch Pratt Free Library Building, Baltimore 1, Md.

GRAPHIC TIME TABLE OF THE HEAVENS. A condensed and simplified almanac in graphic form published annually. Gives the rising and setting times of the sun, moon, and "naked eye" planets and other useful astronomical information. Computed for 40° north latitude and 90° west longitude, it can be corrected easily for the observer's position. Large chart, 44" x 30". $1.25 folded; $1.50 if mailed rolled. Same chart, 17" x 11", 35 cents.

The Mathematical Association of America, c/o The University of Buffalo, Buffalo 14, N.Y.

PROFESSIONAL OPPORTUNITIES IN MATHEMATICS. A booklet describing the work and opportunities of mathematicians. 25 cents.

Models of Industry, 2100 Fifth St., Berkeley, Calif.

MODEL WEATHER STATION KIT. No. 100. 23 experiments that illustrate basic laws which affect weather, and instructions for building 10 weather instruments. A 36-page handbook explains weather terms. Instruction Supplement provides suggested activities, supplementary reading, textbook correlation, films, filmstrips, and vocabulary list. $7.95.

Modern Educational Aids, Postoffice Box 209, Wilmette, Ill.

MAP OF OUTER SPACE. 42" x 35", 5-color map showing the solar system and including information about distances, weights, and heat. $1.

MOON MAP. 38" x 32", 5-color map of the moon identifying many landmarks. Close-up views of the moon's surface. $1.

National Aeronautics and Space Administration, Washington 25, D.C.

THE CHALLENGE OF SPACE EXPLORATION. An illustrated booklet introducing the general reader to the technical side of space exploration. Free.

PROJECT MERCURY. Second Interim Report of the Committee on Science and Astronautics, U.S. House of Representatives, 87th Congress, First Session, May 26, 1961. Free supply limited.

THE PRACTICAL VALUES OF SPACE EXPLORATION. A report of the Committee on Science and Astronautics, U.S. House of Representatives, 86th Congress, Second Session, July 5, 1960. Union Calendar 928, House Report 2091. Answers to the question, "Why Explore Space?" are set forth in this explanation which is designed to tell taxpayers what they can hope for ultimately in return for the sums being spent on the exploration of space. Free.

TIROS. An illustrated leaflet explaining the weather observation satellites. Free.

ECHO I. An illustrated leaflet explaining the passive communications satellite—the 100-foot diameter plastic sphere. Free.

X-15. An illustrated leaflet explaining the experimental X-15 rocket ship project. Free.

EXPLORING SPACE—*Project Mercury & Apollo.* An illustrated booklet explaining the Nation's first manned spaceflight projects. Free.

THE SPACE FLIGHT OF ASTRONAUT SHEPARD AND THE FREEDOM 7, May 5, 1961. Brief pictorial highlights of America's first manned suborbital flight in space. Free.

THIS IS NASA. An illustrated leaflet giving an overview of the work and plans of the National Aeronautics and Space Administration. Free.

National Air Museum, Smithsonian Institution, Washington 25, D.C.

Information leaflets. Illustrated pamphlets giving information about historical aircraft and flyers. *The Wright Brothers*, Information Leaflet No. 8 (rev.); *Samuel Pierpont Langley*, No. 29 (rev.); and *Charles A. Lindbergh and the Spirit of St. Louis*, No. 187 are representative of such leaflets, all of which are free.

Drawings of historic aircraft. Large blueprints designed for use by modelers showing 3-view general arrangement dimensioned drawings with historical and technical notes. Write for Leaflet SIL-122 Rev. (11/59) listing the available drawings. Free.

National Association of Rocketry, Suite 1962, 11 West 42nd St., New York 36, N.Y.

Brochures describing NAR's model rocketry program and information about membership in the organization. Free.

National Aviation Education Council, 1025 Connecticut Ave. NW., Washington 6, D.C.

TEACHING GUIDE FOR THE EARTH AND SPACE SCIENCE COURSE. A comprehensive guide for teachers of junior high school science, prepared by the Pennsylvania State Department of Public Instruction. Covers geology, oceanography, weather, climate, and space science. $1.

THE ARITHMETIC OF FLYING. More than 250 problems involving skills in percentages, decimals, and fractions which the pilot of small aircraft must solve in order to fly safely. Relates arithmetic to the world of flight and includes problems dealing with altitude, temperature, ground speed, fuel consumption, airplane loads, navigation, etc. For seventh and eight grade arithmetic. 50 cents.

THE WRIGHT BROTHERS' *FLYER*. A black and white drawing of the first Wright brothers' aircraft, 16"×20", suitable for framing. Sent in mailing tube. $1.

PICTURES, PAMPHLETS, AND PACKETS. 4th edition. Sources of free and inexpensive booklets, pamphlets, charts, pictures, films, filmstrips, and many other kinds of teaching aids dealing with aviation, weather astronomy, and space exploration. Single copy free to teachers and librarians requesting it on school or library stationery.

SKYLIGHTS. An aerospace fact sheet on current aviation and space news, useful to teachers and students. Published monthly during the school year. Single copy free to teachers, librarians, and adult leaders of youth groups. Requests must be made on school or organization stationery.

HOW TO DEVELOP A TEACHING UNIT ON ROCKETS AND SPACE TRAVEL. A 4-page leaflet including suggestions for motivation, procedures, content organization, activities, evaluation, and resources useful to teachers on all grade levels. Single copy free.

TIME AND SPACE. A unit for junior high school science and mathematics, and a guide for teachers who wish to develop similar units for their own classrooms. Single copy free.

GUIDANCE AIDS FOR A STRONGER AMERICA. A counselor's guide to aviation careers, including a list of colleges and universities offering courses in aeronautical engineering, air transportation, airport management, etc., and a special occupational monograph supplement—"Careers in Aviation". 75 cents.

National Council of Technical Schools, 1507 M St. NW., Washington 5, D.C.

CAREER OPPORTUNITIES FOR THE ENGINEERING TECHNICIAN. A counseling and guidance kit assembled for the information of high school counselors, guidance directors, libraries, etc. 50 cents.

National Geographic Society, 16th and M Sts. NW., Washington 6, D.C.

MAP OF THE HEAVENS. 42"×28" showing constellations, the Milky Way, and stars. Reverse side provides charts of star positions by months. $1., paper; $2., fabric.

A list of space travel articles appearing in issues of the *National Geographic Magazine* from December 1926 through May 1961. Free.

A list of aviation articles appearing in issues of the *National Geographic Magazine* from January 1918 through December 1960. Free.

Geographic School Bulletins featuring the following subjects:

Balloons and dirigibles, Vol. 35, No. 29, May 6, 1957—10¢
Vanguard rocket, Vol. 36, No. 5, Nov. 4, 1957—10¢
Rockets, Vol. 36, No. 12, Jan. 6, 1958—10¢
Satellites, Vol. 36, No. 20, March 3, 1958—10¢
Explorer satellite and IGY tracking projects, Vol. 36, No. 26, Apr. 21, 1958—10¢
The X–15, Vol. 36, No. 30, May 19, 1958—10¢
Tiros I, Vol. 39, No. 2, Oct. 10, 1960—10¢
NASA, Vol. 39, No. 7, Nov. 14, 1960—10¢
Saturn rocket, Vol. 39, No. 13, Jan. 1961—10¢

National Research Bureau, Inc., 424 North Third St., Burlington, Iowa.

YOUR CAREER IN INDUSTRY AS A SCIENTIST OR ENGINEER. No. 102. Outlines the numerous opportunities for careers in science and engineering, and tells how to prepare for them. 20 cents.

YOUR OPPORTUNITIES IN INDUSTRY AS A TECHNICIAN. No. 108. How a student can begin preparations for any one of 50 different technical occupations ranging from aircraft design to nuclear laboratory work. 20 cents.

National Science Foundation, 1951 Constitution Ave. NW., Washington 25, D.C.

SUMMER SCIENCE TRAINING PROGRAM FOR HIGH-ABILITY SECONDARY SCHOOL STUDENTS. A booklet explaining the NSF's program to enable gifted high school students to participate in college-level science, mathematics, and engineering programs in summer. Booklet is issued annually in February. Free

National Society of Professional Engineers, 2029 K St., NW., Washington 6, D.C.

ENGINEERING—A CAREER OF OPPORTUNITY. Helps students develop and answer questions about their interest in and fitness for an engineering career. Free.

F. A. Owen Publishing Co., Dansville, N.Y.

Science Activities Kits. ASTRONOMY—No. 680; JETS—No. 681; ROCKETS—No. 676; WEATHER—No. 678. Each kit includes a teacher's guide giving all the information necessary for presenting the activity, 35 pupil booklets of experiments, and a large illustrated developmental chart. $4. for each kit.

Parks College of Aeronautical Technology, St. Louis University, East St. Louis, Ill.

AERONAUTICS BULLETIN. A 4-page leaflet featuring some aspect of aeronautics or space technology and written in nontechnical language. Published quarterly. Free.

Precision Optical Supply Co., 1001 East 163rd St., New York 59, N.Y.

Price list and instructions for building low cost telescopes. 10 cents.

The Rocket Research Institute, Inc., 3262 Castera Ave., Glendale 8, Calif.

ROCKET SAFETY EDUCATOR. A news letter for those concerned with rocket safety education. Includes reports on current amateur projects, activities of amateur rocket groups, and safety suggestions. $2. a year for four issues.

THE ASTROPHILATELIST. A news letter reporting on mail-by-rocket activities. $1. a year for two or three issues, including an associate membership in the Rocket Research Institute.

HISTORIC DATA ON RRI ROCKETPOST FLIGHTS. Includes a price list of rocketflight philatelic covers for sale to stamp collectors. Free.

SIXTEEN YEARS OF ROCKET SAFETY. A 37-page illustrated report giving an account of rocket safety education programs, activities, and philosophy of the Rocket Research Institute. $1.50.

THE STUDENT ROCKETEER. A periodical designed for student rocket clubs. $1. a year for four issues.

Science Associates, Box 216, 194 Nassau St., Princeton, N.J.

Catalog and folders illustrating and describing various weather instruments and astronomy teaching aids and equipment. Free.

CLOUD CHART. In color, predominating cloud formations and the weather predictions that may be derived from their presence. Large size, 22½" x 17¾", 10 cents. Small size, 16¾" x 10¾", minimum order, 25 for $1.25. 100 small charts, $5.

Science Research Associates, 259 East Erie St., Chicago 1, Ill.

AERONAUTICAL ENGINEERS. No. 201. An occupational brief covering the opportunities in the aerospace industry. 35 cents.

AEROSPACE INDUSTRIES MANUFACTURING WORKERS. No. 81. An occupational brief discussing the opportunities for craftsmen in the aerospace industry. 35 cents.

Science Service, 1719 N St. NW., Washington 6, D.C.

SCIENCE EXHIBITS. A "how to" book for students planning a science exhibit. Covers selection of materials, presentation, display, labeling, lighting, etc. $2.

SCIENCE PROJECTS HANDBOOK. A guide for students planning a science project or exhibit at a science fair. 55 cents.

ASTRONOMY KIT. No. 229. A collection of materials for students from the "Things of Science" listings. 75 cents.

HOW TO GET INTO SCIENCE AND ENGINEERING. A leaflet giving advice to the student who is interested in a career in science or engineering. 10 cents.

PROJECTS: SPACE. Explains the role of the National Aeronautics and Space Administration in the exploration of space for peaceful purposes, and lists space science projects that can be undertaken by high school students. Write for price.

Smithsonian Astrophysical Observatory, Cambridge 38, Mass.

INDEX TO SAO SPECIAL REPORTS NOS. 1 THROUGH 50. A list of free reports on satellite tracking data, orbital predictions, satellite observations, high atmosphere information, and other space science research subjects. Free.

Smithsonian Institution, Distribution Section, Editorial and Publications Division, Washington 25, D.C.

MASTERS OF THE AIR. An illustrated booklet recording the history of manned flight. A revised edition is currently in process. Write for information as to date of publication and price.

THE NATIONAL AERONAUTICAL COLLECTIONS. A book describing the history of aeronautics illustrated by the materials in the Smithsonian's National Air Museum. Includes more than 200 photographs. $1.50.

FORTY YEARS OF AERONAUTICAL RESEARCH. A reprint from the Smithsonian Report for 1955, pages 241–271. Publication 4237. The history of the research activities of the National Advisory Committee for Aeronautics, from its inception in 1915 to 1955. *Out of print.*

The Soaring Society of America, Box 66071, Los Angeles 66, Calif.

SOARING IN AMERICA. A booklet describing the sport of soaring as practiced in America. Answers questions about soaring and includes photographs of U.S. sailplanes, and two drawings on types of soaring and methods of launching. 25 cents.

Space Education and Research, 208 Commercial Building, Avon Lake, Ohio

AUDIO-VISUAL GUIDE TO SPACE TRAVEL. A 33⅓ rpm record recording "Sounds from the Satellites" and "Flight of the Astronaut" (an imaginary

orbital trip). Also includes two charts 22" x 34" in full color depicting and explaining orbital paths of satellites and planetary travel—minimum energy required, gravity, time, involved, etc. $2.

Space Science, 4211 Colie Drive, Silver Spring, Md.

THE SPACE SCIENCE TEACHING HANDBOOK. A 16-page booklet covering outdoor observing parties, science fair projects, teaching aids, discussion of teaching the space sciences, school astronomy clubs, and related subjects, with annotated references. 25 cents.

SPACE SCIENCE. A periodical for students and teachers published monthly except in July and August. Reports on current advances in astronomy, space flight, geophysics, and related subjects. Feature articles are written by distinguished scientists. 75 cents a year; 50 cents a year each for five or more subscriptions sent to the same address.

Strafford Industries Inc., Box 702, Devon, Pa.

MAP OF THE MOON. 35" x 45" giving over 600 named lunar features indexed for easy reference. $1 folded; $1.50 rolled.

MAPS OF MARS. 22" x 28" giving place names and locations with explanations. $1 rolled.

Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

OCCUPATIONAL OUTLOOK REPORT SERIES. Each pamphlet describes the nature of work, employment trends and outlook, training needed, earnings, and advancement in each of the following fields:

Employment Outlook in the Aircraft, Missile, and Spacecraft Field. BLS Bull. No. 1255–3. 10 cents.

Employment Outlook for Geologists, Geophysicists, Meteorologists. BLS Bull. No. 1255–33. 10 cents.

Employment Outlook for Physicists. BLS Bull. No. 1255–61. 5 cents.

Employment Outlook for Pilots, Stewardesses, Other Air Transport Occupations. BLS Bull. No. 1255–62. Includes air traffic controllers and dispatchers. 15 cents.

Employment Outlook for Technicians, Draftsmen. BLS Bull. No. 1255–84. 15 cents.

Employment Outlook in Electronic Manufacturing Occupations. BLS Bull. No. 1255–26. 10 cents.

Employment Outlook in Engineering. BLS Bull. No. 1255–28. 15 cents.

FACTS OF FLIGHT. A booklet presenting essential aircraft operation fundamentals. Explains in nontechnical language why an airplane flies, the effects of the controls, stalls and spins, facts about airplane structure and engine operation, and includes a discussion of takeoff, cruising and landing techniques. 50 cents.

PATH OF FLIGHT. A booklet containing information about the navigation of private aircraft. Navigational aids and flight planning are also discussed. 65 cents.

REALM OF FLIGHT. A condensed elementary text on weather characteristics written for the private pilot. 75 cents.

TERRAIN FLYING. A booklet for the beginning pilot containing observations, opinions, warnings, and advice for pleasant and safe flying. 40 cents.

SOUNDS OF THE TWENTIETH CENTURY. A booklet explaining the noise problems created by modern aircraft, particularly jet aircraft, and what the Federal Aviation Agency is doing to solve them. 15 cents.

OCCUPATIONAL OUTLOOK QUARTERLY, February 1959, Vol. 3, No. 1, Bureau of Labor Statistics. Pages 10–12 of this publication include an article on *Occupations in Space Exploration* which describes the kinds of workers needed in this new and expanding field. Also describes their work and locations. 30 cents.

25 BOOKS ABOUT SPACE, MISSILES, ROCKETS. A folder describing publications that are on sale at the U.S. Government Printing Office. Free.

PRICE LIST 79. AVIATION. A catalog of government aviation publications that are for sale. Free.

THIRD SEMIANNUAL REPORT OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. House Document No. 454, August 30, 1960. An accounting of the activities of NASA during the period October 1, 1959 to April 1, 1960. Progress reports on space flight projects and advanced research make up the bulk of this document 65 cents.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION—FOURTH SEMIANNUAL REPORT TO CONGRESS. Covers the period April 1, 1960 through September 30, 1960. Discusses satellite applications, manned space flight, sounding rockets, lunar, planetary and interplanetary programs, tracking and data acquisition, launch vehicles, propulsion, the life sciences program, aeronautical research, international cooperative programs, and many other activities of NASA. Write for price.

RESULTS OF THE FIRST U.S. MANNED SUBORBITAL SPACE FLIGHT. Proceedings of a conference on Astronaut Shepard's flight, held June 6, 1961 by the National Aeronautics and Space Administration in cooperation with the National Institutes of Health and the National Academy of Sciences. Reports on the medical and technical data obtained

from the first U.S. manned suborbital space flight. Preflight preparations and the training program of the astronauts are also included. 50 cents.

NASA SCIENTIFIC AND TECHNICAL PROGRAMS. Hearings before the U.S. Senate Committee on Aeronautical and Space Sciences, February 28 and March 1, 1961. Project leaders report to Congress on the results of space flight programs and plans for future programs. $1.50.

PROJECT MERCURY: MAN-IN-SPACE PROGRAM OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. Report of the Committee on Aeronautical and Space Sciences, U.S. Senate, 86th Congress, 1st Session, Report No. 1014, December 1959. Factual data on the man-in-space program gathered from committee hearings, and supplemented from reports from governmental agencies and independent sources. Includes the history of *Project Mercury*, the system, the astronaut training program, biomedical programs and launching and tracking plans. 40 cents.

EXTRACLASS ACTIVITIES IN AVIATION, PHOTOGRAPHY, RADIO FOR SECONDARY SCHOOL PUPILS. Office of Education Bulletin No. OE-33009 (Series 1956, No. 11). Actual practices of three club activities important to the nation's scientific and technological progress. Suitable for teachers. 25 cents.

PRICE LIST 48—WEATHER, ASTRONOMY AND METEOROLOGY. A list of publications for sale by the U.S. Government Printing Office dealing with the subjects of the title. Free.

U.S. Department of Commerce, Coast and Geodetic Survey, Washington 25, D.C.

MAP PROJECTIONS FOR MODERN CHARTING. A reprint from the *Military Engineer*, Vol. XL, No. 268. Discusses the various types of map projections. Free.

Obsolete aeronautical charts of various parts of the U.S. and possessions, for demonstrating uses of charts. Charts of specific areas cannot be furnished at a given time. Free.

Catalog of aeronautical charts. Free.

NAVIGATIONAL CHARTS. A brochure describing the various types of aeronautical charts available. Free.

U.S. Department of Labor, Occupational Outlook Service, Bureau of Labor Statistics, Washington 25, D.C.

OCCUPATIONAL OUTLOOK BRIEF: PHYSICAL AND EARTH SCIENCES. A 3-page folder giving a broad description of the occupations in these fields with emphasis on employment trends and outlook. Free.

EMPLOYMENT OUTLOOK FOR ASTRONOMERS. A 4-page leaflet describing nature of work, employment trends and outlook, training needed, earnings, and advancement. Free.

MATHEMATICS AND YOUR CAREER. A 12-page booklet listing the amount of mathematics training needed in about 80 different occupations. Free.

SCIENCE AND YOUR CAREER. A 12-page booklet listing the amount of science training needed in about 80 different occupations. Free.

MATH . . . A STEPPING STONE TO SUCCESS IN MANY CAREERS. Wall chart, 12" x 17", depicting the amount of mathematics training needed in various occupations. Free.

AIR TRANSPORTATION. A wall chart, 12" x 17", depicting the major types of jobs held by airline and other air transportation workers. Free.

U.S. Office of Education, c/o Specialist in Aerospace Education, Washington 25, D.C.

SCHOOLS HAVING CURRICULA IN AERONAUTICAL ENGINEERING. Approved by the Engineers' Council for Professional Development. October 1960. Free.

ECPD ACCREDITED TECHNICAL INSTITUTE PROGRAMS. Leaflet No. OE-57001-61. February 1961. Institutions which offer curriculums of a technical institute type and are approved by the Engineers' Council for Professional Development, the nationally recognized accrediting agency for engineering schools. Free.

AIR TRANSPORTATION AND MANAGEMENT COURSES. Leaflet No. OE-25008-1. Revised 1960. A partial list of offerings in colleges and universities. Free.

COLLEGES, UNIVERSITIES, AND PUBLIC VOCATIONAL SCHOOLS WITH AVIATION FLIGHT OR GROUND SCHOOL COURSES. Approved by the Federal Aviation Agency. Leaflet No. OE-25012. Revised September 1960. List arranged by states. Free.

SELECTED AEROSPACE CAREER AND SCHOLARSHIP REFERENCE SOURCES. Leaflet No. OE-26005-1. Revised 1960. A list of aviation career books and pamphlets including military references and schools offering certain aviation courses. Free.

AEROSPACE PERIODICALS FOR TEACHERS AND PUPILS. Leaflet No. OE-29010. Revised 1960. Annotated list of aviation and aerospace periodicals giving current news, trends, and information in this field. For the teacher. Free.

AEROSPACE EDUCATION COURSES, UNITS, AND ACTIVITIES. Leaflet No. OE-29015. Reprint from *School Life*, April 1960. For the teacher. Free.

SPEED AS A FACTOR IN AVIATION PROGRESS. Leaflet No. OE–29018. Revised September 1960. A list of speed records including names of record holders, the dates records were set, the places and the speeds attained (1906 to 1960). Free.

AEROSPACE AND THE CURRICULUM. Leaflet No. OE–33004. Reprint from *School Life*, December 1959. For the teacher. Free.

AEROSPACE EDUCATION IN THE SOCIAL STUDIES. Leaflet No. OE–31001. Reprint from *School Life*, January 1960. For the teacher. Free.

AMATEUR ROCKETRY SAFETY. News Release HEW–H46, March 31, 1958. Safety rules for student experimentation in rocketry. Free.

U.S. Post Office Department, Press, Radio and Television Branch, Washington 25, D.C.

A BRIEF HISTORY OF AIR TRANSPORTATION OF MAIL. An illustrated pamphlet relating the story of air mail from 1918 to the present time. Free.

William-Frederick Press, 55 East 86th St., New York 28, N.Y.

WHAT THE JET AGE MEANS TO YOU. How the new commercial jets and prop-jets work and how safe is jet flying. 25 cents.

WAY STATIONS IN SPACE—THE PLANETS. Theories about what we may find when we reach the planets, and descriptions of possible spacecraft that will be used in this venture into space. 25 cents.

OUR MAN IN SPACE. A description of *Project Mercury* and the work of the National Aeronautics and Space Administration. 25 cents.

KEEP PACE WITH PROGRESS. A discussion of the new frontiers that are opening up in the space sciences. 25 cents.

AN ENGINEERING CAREER FOR YOUR SCHOOL-AGE CHILD. Stresses the need for early preparation and the importance of specialized knowledge in training for opportunities in the coming age of space travel. 25 cents.

Section 2—Films

The films listed in this section are 16-mm., sound productions in color or in black and white as indicated. They are for sale at the prices indicated. However, many of these are also available for rental. Consult your nearest educational film rental library, or write to seller for the location of the film library handling specific films. Additional films may be located in the following film directory:

EDUCATIONAL FILM GUIDE. The H. W. Wilson Co., 950 University Ave., New York 52, N.Y. Annual supplements available, also.

Also:

A DIRECTORY OF 3660 16 mm. FILM LIBRARIES. U.S. Office of Education Bulletin 1959, No. 4. Available from U.S. Government Printing Office, Washington 25, D.C. $1. An annotated directory of more than 3,600 companies, institutions, and organizations which lend or rent thousands of 16 mm. films on all subjects.

Association Films, 347 Madison Ave., New York 17, N.Y. (Films are obtainable at the following distribution centers:
Eastern Area Exchange, Broad at Elm, Ridgefield, N.J.;
Midwestern Area Exchange, 561 Hillgrove Ave., LaGrange, Ill.
Western Area Exchange, 799 Stevenson St., San Francisco 3, Calif.; and
Southwestern Area Exchange, 1108 Jackson St., Dallas 2, Tex.
Write to center nearest you.)

MAN IN FLIGHT. No. WD–385. Color, 31 min. Traces progress in man's successful conquest of the air from early Greek legends and experiments with heavier-than-air craft to the modern age of jet power. Rental. $12.

MAN IN SPACE. No. WD–384. Color, 31 min. Takes man on a rocket trip into outer space. Discusses weightlessness and ways of meeting new problems of food, clothing, and living conditions. Traces the development of rockets from ancient Chinese weapons to tne 4-stage rocket for interplanetary travel. Rental, $12.

SOUND PROGRESS. No. S–793. Black and white, 13½ min. Explains the role that airports play in our lives and how the aviation industry has created jobs for over 100,000 Americans. Instrument landing systems are demonstrated, and the problem of the reduction of airport noise in the jet age is discussed. Free loan.

The following films are available for showing ONLY in Maine, New Hampshire, Massachusetts, Vermont, Rhode Island, New York, Maryland, Virginia, West Verginia, the District of Columbia, Arkansas, Kansas, Missouri, Oklahoma, and Texas:

OUR MR. SUN. No. S–193. Color, 60 min. Shows the sun in eclipse, tremendous solar explosions and sun spots. Explains its physical characteristics, thermonuclear reactions, photo-synthesis and the making of a solar battery. (Mounted on two reels for showing on two successive days if desired.) Free loan. See above restrictions.

STRANGE CASE OF COSMIC RAYS, THE. No. S–533. Color, 60 min. Presented in the style of a scientific detective story, this film explains what cosmic rays are and demonstrates the operation of the scientific method in the acquisition of knowledge. (Mounted on two reels so each can be shown on successive school days if desired.) Free loan. See above restrictions.

UNCHAINED GODDESS, THE. No. S–574. Color, 60 min. Explains in simple terms what modern science has learned about winds, clouds, precipitation and lightning and how they combine to cause weather. (Mounted on two reels for two successive showings, if desired.) Free loan. See above restrictions.

Bell Telephone Company. Apply to your local Bell Telephone Company business office for the following film:

THE BIG BOUNCE. Color, 14 min. A documentary about *Project Echo* which proved that man-made satellites can be used for intercontinental communications. Describes possible future television and telephone satellite systems. Free loan.

Bray Studios, Inc., 729 Seventh Ave., New York 19, N.Y.

AERODYNAMICS. Black and white. *Part I. Properties of Air.* 8 min. Demonstrations and experiments to show the weight of air, mass, and pressure.

Part II. Lift. 8 min. Explains Bernoulli's principle and its application. Visualization of air flow over wing section in smoke tunnel. Demonstration of loss of lift and why a plane goes into a tailspin. *Part III. Air Resistance and Streamlining.* 8 min. Resistance of air to moving objects; an airplane in flight. Air flow demonstrations, and a comparison of power required to move streamlined and unstreamlined objects of the same diameter. Rental charge for each part, $3. Purchase price for each part, $40.

Carousel Films, Inc., 1501 Broadway, New York 36, N.Y.

WAVES OF THE FUTURE. Black and white. 26 min. Shows how scientists through the use of radio waves and radar have been able to pinpoint the distance between Venus and Earth to within 100 and 200 miles. $135; rental, $15.

Coronet Films, Coronet Building, Chicago 1, Ill.

EARTH: ITS ATMOSPHERE, THE. 11 min. Describes structure and composition of the atmosphere, characteristics of the troposphere, stratosphere, and ionosphere, and the effect of atmosphere. Color, $110; Black and white, $60.

SOLAR SYSTEM, THE. 11 min. Characterizes the planets, relates them to the sun, and shows the forces at work in the solar system. An accurate scale model is used. Color, $110; black and white, $60.

Walt Disney Productions, 500 South Buena Vista St., Burbank, Calif.

EYES IN OUTER SPACE. Color, 26 min. Describes the work of weather stations today in forecasting weather and the possible use in the future of satellites and rockets to control weather and avert destructive storms and hurricanes. $250 lease.

MAN AND THE MOON. Color, 20 min. A realistic and believable trip to the moon in a rocket ship as it may occur in the foreseeable future. Stimulation and motivation for young people considering future vocations. $200 lease.

MARS AND BEYOND. Color, 30 min. Discusses temperatures and atmospheres of the planets and conditions necessary for life. Pictures possible surface of Mars and the ways in which plant and animal life may have adapted to conditions there. Describes an imaginary flight to Mars in an atom-powered spaceship. $300 lease.

Educational Testing Service, 20 Nassau St., Princeton, N.J.

EXPLORING THE EDGE OF SPACE. Color. 19 min. Shows applications of plastic balloons in space reconnaissance at 100,000 feet. Explains interdependence among the scientific disciplines. $210.

REALM OF THE GALAXIES, THE. Color. 19 min. An inquiry into the farthest reaches of the universe at Mt. Wilson and Mt. Palomar Observatories. $210.

Encyclopaedia Britannica Films, 1150 Wilmette Ave., Wilmette, Ill.

EARTH SATELLITES—EXPLORERS OF OUTER SPACE. 17 min. Explains how man-made satellites stay in orbit, and what is learned from them. Black and white $90; color, $180.

EXPLORING THE NIGHT SKY. Black and white, 10 min. The story of constellations and how they got their names, nebulae and other star phenomena, setting and rising of stars and how stars helped in the making of the calendar. $60.

GRAVITY: HOW IT AFFECTS US. 14 min. What gravity is and how it affects man and our earth in the universe. Explains how gravity would affect man during spaceflight and shows gravitational studies and experiments of Galileo and Newton. Color, $150; black and white, $75.

JET PROPULSION. 13 min. Provides a graphic explanation of jet propulsion and its use in aircraft. Explains principles of jet engines, portrays jet aircraft in flight and suggests future potentiality. Color, $120; black and white, $60.

MOON, THE. Black and white, 10 min. Explains major concepts about the moon, gravitational pull, phases of the moon and lunar eclipses. $60.

ROCKETS: HOW THEY WORK. 16 min. Basic principles of rocket propulsion, compared with other types of motive power. Countdown and rocket launching scenes, and explanations of rocket guidance, fuels, and multi-stage rockets. Color, $180; black and white, $90.

STARS AND STAR SYSTEMS. Black and white, 16 min. The astronomer at work with a telescope. Radio telescopes and balloons as additional tools. The vastness of the universe and the heavenly bodies of which it is composed. $90.

TRIP TO THE MOON, A. 16 min. An imaginary rocket trip to explore the surface of the moon. Conditions to be met in navigating to the moon. Includes footage on the Russian lunar probe to the other side of the moon. Color, $180. Black and white, $90.

Film Associates of California, 11014 Santa Monica Blvd., Los Angeles 25, Calif.

ASTEROIDS, COMETS, AND METEORITES. 11 min. Shows how astronomers have learned about asteroids, comets, and meteorites; what they look like; and their place in the solar system. Also illustrates man-made satellites. Color, $110; black and white, $60. Write for rental service information.

HOW WE EXPLORE SPACE. Color, 17½ min. Introduces the instruments scientists use, and the methods by which they obtain information about objects in space. Includes what are believed to be the first color motion pictures made of the planets. $160.

ROCKETS: PRINCIPLES AND SAFETY. 11 min. An introduction to the physical principles upon which rockets work. Explains why rocket motors can operate in outer space, and stresses their dangerous potentials and the need for safety precautions. Color, $110; black and white, $60.

SATELLITES: STEPPING STONES TO SPACE. 17½ min. Explains what satellites are and their importance, how they are launched, and how they stay in orbit. Color, $170; black and white, $90.

International Film Bureau, Inc., 332 South Michigan Ave., Chicago 4, Ill.

ASTRONOMER, THE. Color, 16 min. Presents the methods and tools used by modern astronomers, and depicts the relationship of objects in space. $165.

UNIVERSE. Black and white, 28 min. A journey through space during a night-long vigil at an observatory. Through animation and special effects shape is given to theory. $130; rental, $7.50.

WHAT ARE STARS MADE OF? Color, 16 min. How astronomers learn about the stars; the 200-inch Hale telescope at Mt. Palomar. $165.

McGraw-Hill TEXT FILMS, 330 West 42nd St., New York 36, N.Y.

EXPLORING THE MOON. Color, 16 min. By means of special telescopic and photographic equipment at the Griffith Observatory, the viewer is taken on a hypothetical expedition to the moon. Characteristics and topographical features are discussed. $180.

FIRST FLIGHT OF THE WRIGHT BROTHERS, THE. Black and white, 27 min. Filmed recreation of this outstanding historical event, produced by CBS Television. $135.

INTRODUCTION TO JET ENGINES, AN. Color, 14 min. Through the use of animation, a realistic view of the inside of a jet engine is given. Basic principles of compression, ignition, and expansion of gases are explained. $175.

The films below are a part of a series of 13 films available from McGraw-Hill and produced by the National Academy of Sciences covering the principal fields of geophysical research carried on during the International Geophysical Year. The following five films deal either partly or wholly with space research:

THE SHAPE OF THE EARTH. 27 min. The study of the size and shape of the earth is presented from ancient times to present concepts derived from data obtained from orbiting satellites. Present efforts to refine and perfect man's knowledge of the shape of the earth are outlined and the relationship of this effort to future problems of navigation in space is explained. The determination of position and of distances on the earth by astronomical means is examined. Color, $150; black and white, $80.

THE FORCE OF GRAVITY. 27 min. The nature of gravitation is examined from early times to the present. The role of the gravitational field in accounting for the motions of planets is described. Newtonian and Einsteinian theories are explained and contrasted; gravitational problems of the space age are introduced. Color, $150; black and white, $80.

THE INCONSTANT AIR. 27 min. Man's early efforts to measure pressure and temperature afford a basis for understanding the phenomena that make up both weather and climate. Circulation of the atmosphere is portrayed as well as the role of energy from the sun. How meteorological data are collected and how weather forecasts are arrived at are discussed. Theories on climatic changes and how they might come about are described. Current research in the laboratory and using satellite vehicles are presented. Color, $150; black and white, $80.

RESEARCH BY ROCKETS. 27 min. The exploration of the upper atmosphere by instruments carried aloft by rockets is explained. The history of man's attempts to reach out into the higher atmosphere is portrayed and the variety of modern rocket vehicles, including their principles of operation, is shown. Significant discoveries relating to the atmosphere, ionosphere, the earth's magnetic field, cosmic rays, the aurora, and radiations from the sun are examined. Color, $150; black and white, $80.

SCIENCE IN SPACE. 27 min. Scientific exploration of space and its contents and the placing of satellites in orbit are explained. Significant discoveries of modern space science are shown, including the Van Allen radiation belts. Radio and optical methods of tracking satellites, the telemetry of data from satellites and space probes to earth, and the analysis of these data are stressed. The significance of satellite and space probes to man's understanding of the cosmos is underlined. Color, $150; black and white, $80.

Modern Talking Picture Service, 3 East 54th St., New York 22, N.Y.

SPACE, SCIENCE AND TIME. No. 1697. Black and white, 27 min. Traces scientific endeavor through the ages from Pythagoras to Einstein. Stresses the importance of measurement to our efforts in the race to outer space. Shows how man is depending upon electronic measuring devices to give him information about space travel. Free loan.

National Aeronautics and Space Administration, Technical Information Division (Code ET), Washington 25, D.C.

ASTRONAUTS IN THE CENTRIFUGE. No. HQ-45. Color, 18 min. Shows the centrifuge training conducted during April 1961 at the Navy Johnsville

Centrifuge. Astronauts Grissom, Shepard, and Glenn are shown. Free loan.

BEATING THE HEAT. No. L–215. Color, 19 min. Depicts some of the NASA facilities for studying problems of aerodynamic heating and deceleration. Free loan.

CELESTIAL MECHANICS AND THE LUNAR PROBE. HQa–26. Color, 12 min. Through animation, describes the mechanics of guiding lunar probes. Free loan.

ECHO IN SPACE. No. HQ–37. Color, 14 min. A short version of "*Project Echo*", No. HQ–24. Free loan.

FLIGHT OF FREEDOM SEVEN. HQ–STG–51. Color, 27 min. Newsreel of Astronaut Shepard's flight. A 10-minute version is also available. (HQ–47). Both, free loan.

NASA ROUNDTABLE: SCIENTISTS DISCUSS THE MOON. No. HQ–16. Black and white, 18 min. Participants: R. Jastrow, G. de Vaucouleurs, T. Gold, H. Urey, and N. Christofilos. Free loan.

PROJECT ECHO. No. HQ–24. Color, 27 min. The story of the efforts which placed *Echo I*, a 100-foot sphere, in orbit as an experimental passive communications satellite, August 1960. Free loan.

PROJECT MERCURY REPORT NO. 2. Color, 30½ min. A photographic report showing the progress of *Project Mercury* to the summer of 1960. Free loan.

SATURN—GIANT THRUST INTO SPACE. No. HQ–36. Color, 10 min. Shows the work and plans of NASA concerning the Saturn booster. Free loan.

TIME AND SPACE. No. HQa–27. Color, 27 min. Describes the construction and launching of the *Pioneer IV* space probe. Free loan.

TIROS, EXPERIMENTAL WEATHER SATELLITE. No. HQa–25. Color, 13½ min. Free loan.

TIROS II. No. HQa–31. Color, 6 min. Portrays the recent advances in meteorogical satellites since the launch of *Tiros I*. Free loan.

UNMANNED SPACECRAFT. No. HQ–38. Color, 14½ min. Dr. Hugh L. Dryden discusses the aims of the U.S. space program. The successful launches of unmanned spacecraft in 1959 and 1960 are shown. Models of the *Ranger*, *Surveyor*, *Mariner*, and other future unmanned spacecraft are discussed by Dr. Homer E. Newell. Free loan.

X–15. No. HQa–28. Color, 27 min. A 1960 film showing tests of the experimental X–15 rocket aircraft. Free loan.

Space biology series:

HOW DID LIFE BEGIN? No. HQ–32. Color, 20 min. Discusses experiments conducted at the Florida State University to study the evolutionary relationships between various protein molecules and the synthesis of these molecules. Since food and life are so closely related, the study of proteins may reveal the secret of life's beginnings. Free loan.

THE CHEMISTRY OF LIFE. No. HQ–33. Color, 19 min. A scientist at the University of California describes the synthesis of amino acids, hydroxy acids, purines, and pyrimidines (the building blocks of life) in a random fashion by irradiating a mixture of methane, ammonia, water, and molecular hydrogen in a linear accelerator with high energy electrons. Relates experiments to conditions on Mars and Venus which may support life of some kind. Free loan.

LIFE ON OTHER PLANETS. No. HQ–34. Color, 21 min. Discusses the possibility of life existing on other planets and in various other solar systems. Free loan.

DECONTAMINATION OF SPACE VEHICLES. No. HQ–35. Color, 18 min. A discussion of the biologist's concern with the sterilization of interplanetary probes which would come in contact with other celestial objects, thereby seeding them with earth bacteria and possibly extinguishing forms of life that already exist there. Also considers methods of achieving space probe sterilization. Free loan.

National Educational Television Service, Indiana University, Bloomington, Ind.

ASTRONOMY FOR YOU. A series of films, *each* in black and white, 29 min. long, and renting for $4.75. Discusses the composition of the universe, beginning with our solar system and working outward to the stars.

THE SOLAR SYSTEM: THE SMALL PLANETS. NET–1983. Discusses and illustrates the appearance, position, motions, and physical properties of each of the five smallest planets.

THE SOLAR SYSTEM: THE GIANT PLANETS. NET–1984. Discusses the physical properties, appearance, movements, and satellites of the four largest planets: Jupiter, Saturn, Uranus, and Neptune.

THE EARTH IN SPACE. NET–1985. Discusses the Earth as an object in space. Reviews briefly the makeup of the solar system.

THE MOON. NET–1986. Discusses the Earth's only natural satellite, the Moon. Explains the Moon's physical makeup, movements, size, density, phasing, and eclipse of the Sun and the Moon.

MINOR MEMBERS OF THE SOLAR SYSTEM. NET–1987. Discusses the small objects or debris that travel in the solar system. Explains the physical makeup, size, movements, and origin of asteroids, comets, and meteors. Describes the

major comets including Halley's comet in 1910. Tells about the formation of meteors and meteorites and shows examples.

THE SUN. NET–1988. Discusses the controlling body of the solar system, the Sun. Treats the Sun as a star, explaining its surface, composition, and the manner in which its energy is produced.

MEASURING TIME AND DISTANCE. NET–1989. Discusses the natural and artificial means of measuring time and distance. Explains how the day, month, and year, come from the motions of the Earth and the Moon. Tells how civil time, Universal time and Sidereal time are calculated. Shows how distances in space are measured by the speed of light and the magnitude or brightness of the stars.

FINGERPRINT OF THE STARS. NET–1990. Discusses the various instruments and methods used in gaining knowledge of stellar composition and to study objects in space. Reviews the development of the telescope. Explains the importance of photography, the spectroscope, and radio-astronomy in unlocking the secrets of the universe.

STAR GAZING. NET–1991. Discusses the appearance of the skies and how to locate constellations and individual stars. Explains the celestial sphere, how to use star charts and the telescope. Shows the beginner how to study the skies effectively.

THE NATURE OF THE STARS. NET–1992. Discusses the classification of the stars, their physical properties, magnitude, size, and possible evolution. Explains the Hertzsprung-Russell Diagram for star classification based on magnitude and spectral classification. Concludes with a brief discussion of star evolution.

NEBULAE AND CLUSTERS. NET–1993. Discusses star groupings, double and multiple stars, and galactic and globular clusters. Describes the size and make-up of our galaxy. Explains the distribution, size and shape of other galaxies, star clusters, nebulae, and cosmic dust clouds. Concludes with a brief explanation of one theory concerning star formation.

OUR MILKY WAY GALAXY. NET–1994. Traces man's changing conception of the Milky Way. Points out the many contributions made by various astronomers leading to the present concept of countless galaxies. Tells how the study of other galaxies has provided information about the probable appearance of the Milky Way Galaxy, its dimensions, and stellar population.

GALAXIES AND THE UNIVERSE. NET–1995. Explores astronomy's present conception of the universe. Reviews the physical makeup of the Milky Way Galaxy, its rotation and motion through space. Explains how galaxies are classified. Discusses two conceptions of the evolution of galaxies. Concludes with speculation concerning the possibilities of other planet systems supporting life similar to our own.

DOCTORS IN SPACE. A series of 13 films each in black and white and 30 min. long, and renting for $4.75. Explores scientific developments in space medicine and the many problems related to space travel.

FLIGHT TOWARD THE STARS. NET–1357. Discusses high-altitude flying with particular attention to rocket craft. Relates this discussion to flight in space. Features Wm. Bridgeman, test pilot, who presents an account of his own experiences with the pioneer Douglas "Skyrocket."

MEDICINE OF FLIGHT. NET–1358. Traces the development of aviation medicine. Discusses the founding of the Department of Space Medicine at the School of Aviation Medicine, U.S. Air Force. Shows the kind of experimental research in high-altitude physiology being performed.

THE SEA OF AIR. NET–1359. Surveys the special problems of space medicine. Describes the physical characteristics of the upper atmosphere—vanishing oxygen and atmosphere, ultraviolet and cosmic radiation, heat and friction, meteors, contrasts of light and darkness, and the type of sealed cabin being developed for space flight.

LIVING ROOM IN THE VOID. NET–1360. Discusses protective devices for flyers in space. Demonstrates the Air Force partial pressure suit. Explains the effects of "explosive decompression." Presents a design for a three-stage rocket vehicle. Points out special features of the cabin unit.

THE GAS OF LIFE. NET–1361. Explains the importance of oxygen in sustaining life. Points out problems involved in developing a closed ecological system such as a sealed cabin in space. Presents the research being conducted with photosynthesis.

THE UNSEEN BURDEN. NET–1362. Discusses the effects of air pressure on the human body. Relates the protection which the earth's atmosphere affords to problems of space travel. Stresses the problems of preventing the body fluids from bubbling away, cushioning the impact of meteors, and the threat of ultraviolet and cosmic radiation. Outlines the pioneer experiments in "explosive decompression."

A TORRID JOURNEY. NET–1363. Discusses the problems of radiant heat from the sun with respect to space travel. Stresses aerodynamic heating from friction when leaving and re-enter-

ing the earth's atmosphere. Features the late Captain Iven C. Kincheloe U.S. Air Force test pilot, who tells of his experiences with the rocket powered Bell X–2 and discusses the X–15 rocket plane.

ATOMIC BARRAGE. NET–1364. Discusses the problems of ultraviolet radiation and cosmic rays in space travel. Reviews studies concerning the harmful effects of ozone. Explains the origin and nature of cosmic rays. Reports on experiments with mice and other animals exposed to cosmic rays during high-altitude balloon flights.

COLLISION STATIONS. NET–1365. Discusses the problem of meteorite damage during space travel. Demonstrates the Navy's full-pressure space suit for emergency exit. Explains the difficulties of escape and survival in space.

ETERNAL DAY, ETERNAL NIGHT. NET–1366. Provides an imaginary ride in a space satellite 784 miles above the earth. Discusses the problems of absence of sound in space, contrast between light and darkness, and physiological and psychological disturbances.

THE UNSUBSTANTIAL FLESH. NET–1367. Discusses the problems of weightlessness during space flight. Explains experiments being conducted on weightlessness. Tells how weightlessness is achieved during jet plane flight.

SATELLITES AND MISSILES. NET–1368. Discusses the development of the rocket missile and earth satellite. Presents a description of the ballistic missile program. Forecasts the use of rocket vehicles in transcontinental and intercontinental passenger transport. Explores the uses of manned satellites in weather studies, communications, and research on conditions in outer space.

LIFE ON OTHER WORLDS. NET–1369. Discusses the question of life on other planets. Reviews what is known and speculated about the biological environments on other worlds—especially Mars—and the possibility of finding or establishing life on them.

FRONTIER TO SPACE. A series of films, each in black and white, 15 min. long and renting for $3 (unless otherwise noted), presenting the fundamentals of rocketry and problems associated with it. Surveys jet propulsion, interplanetary travel and the capabilities and limitations of rockets.

INTRODUCTION TO ROCKETRY. NET–287. Surveys the general field of rocket science, and outlines the history of rocket propulsion. Notes some of the dangers connected with rocket experimentation and demonstrates the theory of rocket propulsion.

BACKGROUND OF ROCKETRY. NET–288. Traces the various methods of propulsion. Explains the development of jet propulsion by the Chinese in 1232. Relates the history of the use of rocket power to the age of firearms. Surveys the actualities and dreams of rocketry throughout its development.

MODERN DEVELOPMENT IN ROCKETRY. NET–289. Traces the history of the liquid-fuel missile in Germany and the United States. Views the development of the White Sands Proving Grounds and a parallel development of rocketry by the Germans, and explains the similarity of the two.

REACTION AND MOMENTUM. NET–290. Explains the principle of propulsion, and illustrates the way in which the design of a rocket engine increases the speed of escaping gases. Illustrates the law of momentum as applied to propulsion.

THE SPEED OF SOUND. NET–291. Explains that a major problem of jet propulsion is increasing the speed of the expanding gas in the jet engine. Shows how the speed is increased by the addition of heat, more gas, and heavier molecules.

THE ROCKET NOZZLE. NET–292. Reviews the principles of sound and its transmission as it applies to rocket propulsion.

THE V–2. NET–293. 14 min. Traces the history of the development of the V–2 rocket by the Germans and illustrates the operation of the rocket motor. Views various experimental flights of the V–2 rocket.

TURBOJETS, PULSE JETS, AND RAMJETS. NET–294. 14 min. Contrasts pulse jets, turbojets, and ramjets to a true rocket. Compares the operation of a true rocket engine with that of a jet engine, and explains the operation of the three types of jet engines showing the advantages and disadvantages of each.

THE AEROBEE. NET–295. Outlines the construction of the Aerobee, a high-altitude research rocket. Takes rocket through its prefiring checks and its actual firing and shows recovery.

THE VIKING. NET–296. Shows fueling operation, firing of the Viking missile. Pictures the recovery of the rocket and explains that upper air information may be obtained by a study of the parts that are recovered.

RANGE SAFETY AND MISSILE GUIDANCE. NET–297. The problem of controlling the flight of rockets and keeping them within the proving area. Explains the missile guidance system using radar as the basic information source.

HIGH ALTITUDE ROCKETS. NET–298. Reviews the all-time altitude record of the WAC Corporal missile attached to the nose of the V–2 rocket. Discusses the multistage rocket as the solution to overcoming atmospheric drag and gravity.

UPPER ATMOSPHERE STUDIES. NET–299. Shows how rockets have been used to determine the properties of the upper air.

RECOVERY OF INFORMATION FROM ROCKETS. NET–300. Inspects equipment that is placed in a rocket to enable it to transmit upper air and rocket operation information to a ground station. Shows how this information is recorded and inspected to reveal the characteristics of the upper air.

HIGH ALTITUDE PHOTOGRAPHY. NET–301. Briefly traces the history of aerial photography. Illustrates the use of aerial photography and shows how films can be used to determine the orientation of the rocket in flight.

LARGE FORCES ACTING ON THE BODY. NET–302. Relates to rocket development the problem of getting a man out of a fast-moving aircraft with a minimum of personal injury. Pictures of the rocket sled at Holloman Air Force Base.

BALANCE AND ORIENTATION IN HUMANS. NET–303. Describes the problem of reducing the effect of gravity on humans. Discusses the sense of sight, balance, position, and touch and how they will be affected by upper air travel.

ANIMALS IN SUBGRAVITY CONDITIONS. NET–304. Surveys the problem of human survival in space. Pictures the firing of an Aerobee containing two monkeys and two mice.

COSMIC RAY STUDIES. NET–305. Discusses the problem of harmful effects on the human body caused by exposure to cosmic radiation. Describes effects of cosmic radiation at high altitudes on animals, insects, eggs, and seeds.

THE EARTH SATELLITE: PART 1. NET–306. Explains centrifugal force and its relationship to the establishment of an earth satellite. Shows the three-stage missile and the part it plays in the formation of the satellite. Outlines various possible orbits of such a satellite.

THE EARTH SATELLITE: PART 2. NET–307. Discusses the problems related to the recovery of a multi-stage rocket used to establish an earth satellite. Describes recovery techniques.

THE MOON. NET–308. $4.75. Discusses characteristics of the moon in relation to space travel—its atmosphere and surface. Compares the possible role of the moon in space travel to the use of an artificial satellite.

MARS. NET–309. Discusses characteristics of Mars in relation to space travel. Describes conditions on Mars that indicate the absence of intelligent life as we know it. Outlines the difficulties and advantages of a trip to Mars.

SPACE HIGHWAYS. NET–310. Discusses navigational routes in space travel. Describes parabolas, hyperbolas, and ellipses as the curves that will be traced by spaceships coasting in planetary and solar gravitational fields.

THE SUN. NET–311. Discusses the influence of the sun upon space travel. Shows solar prominences and flares, and discusses their influence on us.

PRESENT STATUS AND USE OF NUCLEAR POWER. NET–312. Summarizes the fundamentals of space travel discussed in the 25 programs in the FRONTIER TO SPACE series. Briefly explores the possibilities and difficulties of nuclear powered rockets.

COMING SPACE AGE, THE. NET–1418. Black and white, 60 min. Presents the history of man's battle to conquer space and a panel discussion of the implications of space flight. Uses film clips showing the earliest man-made rockets, the German V–2 rocket and recent work in rocket development. Participants include William H. Pickering, Fred L. Whipple, and S. Fred Singer. Rental, $8.

METEOROLOGY. NET–2062. Black and white, 29 min. Examines the role of meteorological research in the Antarctic Program of the International Geophysical Year. Shows how weather observations are taken, organized, and the uses to which the information is put. Rental, $4.75.

STUDIES OF THE UPPER ATMOSPHERE. NET–2066. Black and white, 29 min. Discusses the upper atmosphere studies of the International Geophysical Year and the role of the Antarctic Program. Explains the layers of the atmosphere and techniques used in studying the various phenomena which occur there. Rental, $4.75.

Shell Oil Co., 50 West 50th St., New York 20, N.Y. Write for location of nearest office serving your area.

APPROACHING THE SPEED OF SOUND. Color, 27½ min. An introduction to high speed flight. Explains how sound travels and why the speed of sound affects high speed aircraft. Free loan.

HOW AN AIRPLANE FLIES. Six films which break down the theory of flight into major components. All films are black and white, (free loan):

LIFT. 12 min. How an airplane stays up.
DRAG. 15 min. Why an airplane is streamlined.
THRUST. 6 min. How an airplane moves through the air.
FORCES IN BALANCE. 8 min. How natural forces are controlled in flight.

STABILITY. 10 min. How a plane maintains stability.

CONTROLS. 10 min. How a pilot flies a plane.

TRANSONIC FLIGHT. Color, 20 min. Gives a graphic analysis of the technical problems in the transonic range—those speeds at which airflow around a plane is part subsonic and part supersonic. Shows how designers have solved these problems and have made transonic flight smooth and safe. Free loan.

Sterling Movies, U.S.A., 100 West Monroe St., Chicago 3, Ill.

TOMMY LOOKS AT SPACE. No. 603. Black and white, 20 min. Describes the function of the space suits being used by our man-in-space program. Gives historical background on early use of high-altitude suits and interesting descriptions of how suits are made. Helpful data on how changes in air pressure effect astronauts. Free loan.

U.S. Air Force Film Library Center, 8900 South Broadway, St. Louis 23, Mo. (*Alaska residents* should request films from the A. F. Branch Film Library, Elmendorf Air Force Base, Alaska. *Hawaii residents* should send request for films to Base Film Library, Hickam Air Force Base, Hawaii.) Films marked with an asterisk (*) are available for purchase from United World Films, 1445 Park Ave., New York 29, N.Y.

*AERO MEDICAL RESEARCH. No. SFP–390. Color, 27 min. Describes intensive research required to enable man to fly faster and higher with safety and comfort. Free loan.

ANIMALS IN ROCKET FLIGHT. No. SFP–316. Black and white, 14 min. A report on experiments to determine conditions man will encounter in space. A camera inside an Aerobee rocket records the effects of rocket travel on two monkeys and two white mice. Free loan.

CHALLENGE OF OUTER SPACE. No. OC8. Black and white, 61 min. Dr. Wernher von Braun, noted rocket and outer space scientist, defines the characteristics, functions and problems of guided missile models. Free loan.

MAN IN SPACE. No. SFP–571. Color, 35 min. Traces man's early attempt to penetrate the vast unknown and illustrates in animated form the possibilities of space travel, the problems involved, and the knowledge to be gained. Free loan.

*REACHING FOR SPACE. No. SFP–603. Black and white, 14 min. Describes extensive research the Air Force is conducting to meet the challenge of our country's newest frontier. Free loan.

ROCKET CLUB. No. SFP–674. Color, 14½ min. Presents an exciting and educational story about a young rocketeer who learns that the best way to build rockets is with a group supervised by a scientist or a teacher. Free loan.

*SPACE NAVIGATION. No. TF–1–5295. Color, 13 min. Film explains the science of interplanetary flight through an animated, imaginary trip to Mars. Elements of navigation, guidance and control are depicted. Free loan.

*SURVEY OF ASTRONAUTICS. No. TF–1–5292. Color, 23 min. Based on the current Air Force concept of space exploration and man's progress in mastering rocket flight, this film presents a theoretical forecast of what lies ahead for man in the science of astronautics. Free loan.

VERTICAL FRONTIER. No. SFP–644. Color, 28 min. The story of aviation medicine and the tremendous research that is being carried on to hasten the day when man will explore the heavens. Free loan.

U.S. Army films. Available from military district which serves your area as indicated below:

Commanding General, *First U.S. Army*, Governors Island, N.Y.
Attn: Signal Officer.
Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, New York.

Commanding General, *Second U.S. Army*, Ft. George Meade, Md.
Attn: Signal Officer.
Maryland, Pennsylvania, Virginia, Ohio, West Virginia, Kentucky, Delaware.

Commanding General, *Third U.S. Army*, Ft. McPherson, Ga.
Attn: Signal Officer.
North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi.

Commanding General, *Fourth U.S. Army*, Ft. Sam Houston, Tex.
Attn: Signal Officer.
Arkansas, Texas, Oklahoma, New Mexico, Louisiana.

Commanding General, *Fifth U.S. Army*, Chicago, Ill.
Attn: Signal Officer.
Indiana, Illinois, Michigan, Wisconsin, Missouri, Kansas, Iowa, Nebraska, Minnesota, North Dakota, South Dakota, Wyoming, Colorado.

Commanding General, *Sixth U.S. Army*, San Francisco, Calif.
Attn: Signal Officer.
Washington, Oregon, Idaho, Montana, Utah, Nevada, Arizona, California.

Commanding General, Military District of Washington, Washington 25, D.C.
District of Columbia and adjacent metropolitan area.

Headquarters, U.S. Army, Alaska, Ft. Richardson, Alaska.
ALASKA

Headquarters, U.S. Army Pacific, Ft. Shafter, Hawaii.
HAWAII

FRONTIER BEYOND THE SKY. MF 45–9502. Color, 26 min. Describes the International Geophysical Year rocket program for upper atmosphere research carried on by the U.S. in 1957. Covers in-

struments and experiments connected with study of solar radiation, cosmic rays, the ionosphere, and the structure and temperature of the upper atmosphere.

LAUNCHING OF EXPLORER I. MF 21-8933. Black and white, 10 min. The story of the historic launching of the first U.S. earth satellite, Explorer I, January 31, 1958. Depicts features, assembly and testing of each stage, final assembly, fueling, countdown, firing, and launching.

U.S. Navy films. Available from the Naval District which serves your area as indicated below:

First Naval District, 495 Summer St., Boston 10, Mass.
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Third Naval District, 90 Church St., New York 7, N.Y.
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Fourth Naval District, U.S. Naval Base, Philadelphia 12, Pa.
Pennsylvania, Ohio, Delaware, southern New Jersey.

Fifth Naval District, U.S. Naval Base, Norfolk 11, Va.
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Sixth Naval District, U.S. Naval Base, Charleston, S.C.
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Ninth Naval District, U.S. Naval Training Center, Great Lakes, Ill.
North Dakota, South Dakota, Wyoming, Colorado, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Michigan.

Eleventh Naval District, 937 Harbor Drive, San Diego 30, Calif.
Southern California, Arizona.

Twelfth Naval District, Federal Office Bldg., San Francisco 2, Calif.
Central and northern California, Nevada, Utah.

Thirteenth Naval District, U.S. Naval Air Station, Seattle 15, Wash.
Washington, Oregon, Montana, Idaho.

Fourteenth Naval District, Pearl Harbor, Hawaii.
Hawaii.

Seventeenth Naval District, Kodiak, Alaska.
Alaska.

Potomac River Naval Command, U.S. Naval Gun Factory, Washington 25, D.C.
Washington, D.C. metropolitan area.

ABC OF G, THE. MN-3446. Color, 19 min. Shows how linear acceleration produces more Gs. Distinguishes between positive and negative G. Shows test equipment used in research to determine how soon subject greys out, blacks out, or reds out. Also describes effects of 2 to 9G force on the blood in the body.

CHALLENGE OF OUTER SPACE. MD-8204H. Black and white, 61 min. Dr. Wernher von Braun lectures an officers' conference on guided missiles—how they function, the problems involved in achieving operational effectiveness, and the challenge presented by outer space.

HURRICANE HUNTERS. MN-8339. Black and white, 14 min. Describes the hurricane hunting activities of Airborne Early Warning Squadron Four.

L. T. A. HISTORY—BALLOONS. MN-2722A. Black and white, 26 min. Illustrates history of balloon experimentation covering problems, development, outstanding men, and modern balloon use.

Section 3—Filmstrips

The filmstrips listed in this section are 35 mm., with captions, in black and white and in color as indicated. Because of generally lower purchase prices, rental arrangements usually are not offered. Some distributors will ship filmstrips on approval. Additional filmstrips may be located in the

FILMSTRIP GUIDE. H. W. Wilson Co., 950 University Ave., New York 52, N.Y. Annual supplements available, also.

Civil Air Patrol, National Headquarters, Ellington Air Force Base, Texas

AEROSPACE EDUCATION AND YOUR SCHOOL. 59 frames, color. Suggests methods of placing aerospace education in the school. Includes 33⅓ rpm record. $5.75.

AIRCRAFT IN FLIGHT. 60 frames, color. Pictures and describes the basic principles of flight, design, and structure of modern aircraft. Includes 33⅓ rpm record. $5.75.

AIRPORTS, AIRWAYS, AND ELECTRONICS. 56 frames, color. Explains air traffic control for airports and airways. Contains an excellent presentation of basic electronic devices. Includes 33⅓ rpm record. $5.75.

AVIATION AND YOU. 73 frames, color. Discusses the importance of aviation and its influence on man's thinking and action. Includes 33⅓ rpm record. $5.75.

NAVIGATION AND THE WEATHER. 48 frames, color. Contains explanation of types of navigation. Discusses weather and its relation to aviation. Includes 33⅓ rmp record. $5.75.

POWER FOR AIRCRAFT. 52 frames, color. Discusses the various types of propulsion systems used in aircraft. Presents the scientific principles related to aircraft power plants. Includes 33⅓ rpm record. $5.75.

PROBLEMS OF AEROSPACE POWER, THE. 33 frames, color. Presents the various problems of aerospace power and the efforts made toward their solution. Includes 33⅓ rpm record. $5.75.

Curriculum Materials, 1319 Vine St., Philadelphia 7, Pa.

AIR TRANSPORTATION. 26 frames, color. A revision of a 1950 filmstrip that shows the history of flight and the influences of air transportation, including the social and political problems resulting from the airplane. $4.50; rental, $1.

Encyclopedia Britannica Films, 1150 Wilmette Ave., Wilmette, Ill.

FLIGHT AROUND THE MOON. 49 frames, color. An imaginary flight around the moon in a manned rocket ship. $6.

FLIGHT INTO SPACE. 49 frames, color. An imaginary flight into space in a manned space vehicle. $6.

FLIGHT TO MARS. 49 frames, color. An imaginary flight in a spaceship from a space station to Mars. Discusses possible Mars landscape. $6.

MAN BECOMES AN ASTRONOMER. 49 frames, color. Describes the teachings of Copernicus and Galileo, and shows how man has learned about the universe. $6.

MAN IN FLIGHT. 49 frames, color. A history of aviation from the Wright brothers through World War II. $6.

MAN IN SPACE. 49 frames, color. Demonstrates how man reacts physically and mentally to the experience of space travel. $6.

MAN LEARNS TO FLY. 49 frames, color. Summarizes the history of flight before the 20th century. $6.

Eyegate House, 146-01 Archer Ave., Jamaica, Long Island, N.Y.

AVIATION IN THE SPACE AGE. 39 frames, color. Reviews progress of aviation, introduces jet and rocket engines, radar, and automatic controls. Discusses various types of planes. $4.

CONQUEST OF SPACE, THE. 39 frames, color. Background of rockets; reasons for space research; use of rockets in peace and war; the difference between balloons, planes, and rockets in flight. $4.

DESTINATION SPACE. 36 frames, color. Factors that must be considered in placing a satellite in orbit, particularly manned vehicles. Discusses improbability of man ever reaching the stars. $4.

EXPLORATION OF SPACE. 36 frames, color. Compares space studies of Copernicus, Galileo, and Kepler with today's techniques. Explains recent discoveries in space and discusses why we should explore space. $4.

HAZARDS IN SPACE TRAVEL. 36 frames, color. Problems and hazards of space travel, and how they are being solved—acceleration, food, air, sanitation, g forces, radiation, heat and cold, escape systems. $4.

MAN TRAVELS IN SPACE. 36 frames, color. Space vehicles of the future, testing and training of astronauts, safety devices developed, and a discussion of satellite payloads and their accomplishments. $4.

PIONEERS OF SPACE. 35 frames, color. Describes history of man's efforts to fly, including references to da Vinci, the Wright brothers, and the first balloons. $4.

STATIONS ON THE MOON. 39 frames, color. Plans for the exploration of the moon, including interim plans and the race to the moon with the Soviets. $4.

TIME, SPACE, AND ENERGY. 30 frames, color. Introduces concepts of time, space and energy as applied to our universe. Discusses gravitation, life in space, escape velocity, radio telescopes, light years, and many other topics in the news. $4.

Films for Education, Audio Lane, New Haven, Conn.

BETWEEN THE PLANETS. 59 frames, color. The debris of space—comets, asteroids and meteors which so far have proved little hazard to space travel. $7.50.

EXPLORING THE SPACE AROUND EARTH. 59 frames, color. Why rockets are necessary for the exploration of space, how they work. $7.50.

INFORMATION FROM SATELLITES. 63 frames, color. The uses of satellites and space stations. Possibilities of space travel. $7.50.

MARS. 45 frames, color. The fascinating mysteries of this planet, its relationship to the solar system, and characteristics. $7.50.

MERCURY AND VENUS. 40 frames, color. Discusses these planets, their relation to the solar system and their characteristics. $7.50.

MOON, THE. 72 frames, color. Ancient concepts and modern knowledge about the moon. Phases of the moon are explained. $7.50.

Goodyear Aircraft Corporation, Public Relations Dept., Akron 15, Ohio

ARTIFICIAL SATELLITES AND SPACE EXPLORATION. 25 frames, color, with tape. Discusses optical and radio telescopes, rockets, rocket engines, and satellites; how orbits are maintained; tracking satellites; moon rockets; gravity, the planets, nebulae and galaxies. Free loan.

Jam Handy, 2621 E. Grand Blvd., Detroit 11, Mich.

EARTH'S ATMOSPHERE, THE. 37 frames, color. The layers of the atmosphere are clearly and simply visualized. How the phenomena occuring in each layer present problems in man's effort to travel in the atmosphere and beyond. $5.75.

HOW DO HELICOPTERS FLY? 33 frames, color. How rotary wing provides lift and thrust; how the pilot controls the helicopter. The various kinds of helicopters and how they serve man. $5.75.

HOW DO JETS FLY? 40 frames, color. How a jet engine works, the sound barrier, and the advantages of jets over propeller-driven planes. $5.75.

ROCKET POWER FOR SPACE TRAVEL. 40 frames, color. How a rocket works in airless space. Multistage rockets. Rocket planes. How satellites stay in orbit. Problems of space travel. $5.75.

SAFETY IN FLIGHT. 37 frames, color. How the study of weather and the use of radar and instrument landing systems contribute to the safety of air travel. $5.75.

WHAT MAKES AN ARPLANE FLY? 40 frames, color. How the propeller and wing are designed to make an airplane fly. The four forces at work during flight. Examples of the ways aircraft serve man. $5.75.

McGraw-Hill TEXT FILMS, 330 West 42nd St., New York 36, N.Y.

ASTRONOMER AT WORK. 40 frames, color. Describes various tools used by astronomers for investigating the planets and stars. Illustrates simple tools that can be made by amateur astronomers. $6.

FLYING WITH JETS AND ROCKETS. 50 frames, color. Demonstrates how a jet engine works and how it differs from a rocket. $6.50.

The New York Times, Office of Educational Activities, Times Square, New York 36, N.Y.

NEW FRONTIERS IN SPACE. 55 frames, black and white. An up-to-the minute look at man's penetrations into space, the knowledge gained from man-made satellites, and the new projects and goals ahead in space. $2.50. Available in May, 1962.

RACE FOR SPACE. 59 frames, black and white. What mankind's first steps into outer space mean for nations and men; prospects of space stations, flights to the moon. $2.50.

Prentice-Hall, Educational Book Division, Englewood Cliffs, N.J.

ASTRONOMY. 31 frames, color. Illustrates the relationship between earth and the other members of our solar system. Aids in comprehension of man's place in the universe. $4.

Society for Visual Education, 1345 West Diversey Parkway, Chicago 14, Ill.

AIR ABOUT US, THE. No. L 427–6. 48 frames, black and white. Air and its properties—compression, expansion, contraction, pressure movement (wind), and the chemistry of air. $3.

CLOUDS, RAIN AND SNOW. No. L 427–13. 48 frames, color. Formation of clouds, rain, snow, hail, sleet, dew, frost and fog. Rainbows, lightning and other phenomena. $6.

COMETS AND METEORS. No. LX 487–4. 56 frames, black and white. How they differ, where they come from. Meteors that have struck earth, and comets. $3.50.

CONSTELLATIONS. No. LA 487–6. 52 frames, black and white. How to locate them. How they change positions. A 12-frame sequence shows the different constellations that appear each month. $3.50.

CURRENT EVENTS IN SPACE. No. L 484–2. 47 frames, color. Explains functions of satellites. Covers first successful moon shot showing step-by-step launching of the satellite into orbit. Tells how it is tracked $6.

EARTH IN SPACE, THE. No. LX 487–1. 40 frames, black and white. Size and movements of the earth and its relationship to the sun. Gravitation is explained. $3.50.

EARTH'S NEAREST NEIGHBOR. No. LA 427–14. 45 frames, color. A description of the moon and its relationship to earth. Includes imaginary exploration of the moon and discusses the needs of the human body in relation to conditions on the moon. $6.

EARTH'S SATELLITE—THE MOON. No. LX 487–3. 66 frames, black and white. The phases of the moon, how it affects gravity and tides and its features as seen through the telescope and an imaginary trip. $3.50.

JET-AGE FLIGHT. 32 frames, color. How jet airliners fly and how jet engines work. Describes air traffic control, passenger services, and behind-the-scenes activities of jet-age flight. Teacher's manual included. $1 service charge.

LEAVING THE WORLD. No. L 484–1. 41 frames, color. Pictures man-made satellites recently launched. Shows how rockets developed. Explains rocket power, thrust, and speed of release. $6.

MAN IN SPACE. No. L 484–3. 47 frames, color. Shows how men are being trained for outer space. Obstacles to be overcome—weightlessness, acceleration, temperature extremes, radiation. Discusses space stations. $6.

NEIGHBORS IN SPACE. No. LS–3. 36 frames, color. Up-to-date facts on sun, moon, planets, and stars. $5.50.

New WHY DOES IT RAIN, SNOW, HAIL AND SLEET? No. L 421–4. 39 frames, color. Latest scientific methods for weather study, including TIROS satellite and actual photos taken many miles above the earth. Conditions for cloud formations, relative humidity, difference between sleet and hail. $5.50.

New WHY DOES THE WEATHER CHANGE? No. L 421–2. 39 frames, color. Chief air masses that affect weather in the U.S. Defines polar, tropical, maritime, and continental in relation to weather. Explains warm, cold, stationary and occluded fronts. Also photographs of various types of clouds. $5.50.

New WHY DOES THE WIND BLOW? No. L 421–1. 33 frames, color. Explains cause of local winds, jet streams, prevailing winds. Also actual photos of a tornado, a hurricane (as seen from the air) and a blizzard. $5.50.

New WHY THE SEASONS? No. L 421–3. 30 frames, color. How earth's relationship to sun produces the seasons. Defines summer and winter solstices and equinoxes. $5.50.

OUR OCEAN OF AIR. No. L 427–3. 48 frames, black and white. Air density, high and low pressure areas; the use of barometers, wind direction and velocity. $3.

PICTURES IN THE SKY. No. LA 427–17. 46 frames, color. Constellations and their locations, including first magnitude stars. Discusses the earth's rotation and why summer and winter skies are different. $6.

SPACE TRAVEL A.D. 2000. No. L 484–4. 52 frames, color. Emphasizes nature of space, facts of astronomy and shows relationship of time and distance to space travel. What other worlds might be like; new forms of power being studied—atomic engines, plasma and photon power, ion propulsion. $6.

STARS AND GALAXIES. No. LA 487–5. 43 frames, black and white. Size and distance from the earth. Number of stars. The Milky Way, nebulae and other galaxies we know. $3.50.

SUN AND ITS FAMILY, THE. No. LA 427–15. 46 frames, color. Planets, asteroids, comets, meteors and other elements of the solar system. Gravity, solar energy and the seasons are discussed. $6.

SUN AND ITS PLANETS, THE. No. LX 487–2. 55 frames, black and white. What we know about other planets and how they move. Explains asteroids and auroras. $3.50.

WEATHER. No. LS–4. 34 frames, color. How clouds form and change to rain. Lightning and air fronts are discussed. $5.50.

WORK OF ASTRONOMERS, SPACE TRAVEL. No. LA 487–7. 45 frames, black and white. Observatories and equipment and the information they ob-

tain. Recent satellites launched. The future of space travel and manned space stations. $3.50.

YOU AND THE UNIVERSE. No. LA 427-16. 43 frames, color. Earth as a member of our galaxy, the nature and number of galaxies, light years and an analysis of earth motion. $6.

Stanbow Productions, Valhalla, New York

OUTER SPACE—THE NEW FRONTIER. (A Current Affairs release.) 38 frames, black and white. The background of developments in the exploration of space. Visualizes factors leading to the conquest of this new frontier. $3.50.

United World Films, 1445 Park Ave., New York 29, N.Y.

JET PROPULSION AND GAS TURBINES. 22 frames, color. Explains and demonstrates jet engines and jet reaction. Shows simple type jet, turbo-jet, and turbine. $5.

Your Lesson Plan Filmstrips, 1319 Vine St., Philadelphia 7, Pa.

DESTINATION MOON. 52 frames, color. The conquest of the air and the obstacles to be overcome to reach the moon. $6; rental, $1.50.

ENERGY FROM JETS AND ROCKETS. 50 frames, color. Explains the principles of jet and rocket engines, how they differ; shows the relatively few parts of the jet engine in operation. $6; rental, $1.50.

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